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# BOTANICAL ABSTRACTS

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# BOTANICAL ABSTRACTS

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Vol. VI JANUARY, 1921 No. 4

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## AGRONOMY

C. V. PIPER, *Editor*

MARY R. BURR, *Assistant Editor*

1398. ANONYMOUS. **United States grades for milled rice recommended by the United States Department of Agriculture.** U. S. Dept. Agric. Dept. Circ. 133. *16 p.* 1920.

1399. ANONYMOUS. **Spur feterita.** U. S. Dept. Agric. Dept. Circ. 124. *4 p.* 1920.—A member of the sorghum group. General notes on culture and feeding value.—*L. R. Hesler.*

1400. ANONYMOUS. **Grimm alfalfa.** U. S. Dept. Agric. Dept. Circ. 123. *4 p.* 1920.—Description, seeding, and inoculation.—*L. R. Hesler.*

1401. ANONYMOUS. **Dry-land alfalfa.** U. S. Dept. Agric. Dept. Circ. 122. *4 p.* 1920. Description and discussion of seeding.—*L. R. Hesler.*

1402. ANONYMOUS. **Velvet beans.** U. S. Dept. Agric. Dept. Circ. 121. *3 p.* 1920.—Description, planting, feeding value, and notes on varieties.—*L. R. Hesler.*

1403. ANONYMOUS. **Alfalfa.** U. S. Dept. Agric. Dept. Circ. 115. *6 p.* 1920.—A general discussion, including description, soil requirements, preparation of land, liming, fertilizing, inoculation, seeding, and treatment of the stand.—*L. R. Hesler.*

1404. ANONYMOUS. **Effect of frost on cane.** [Rev. of: ANONYMOUS. **Letter to Nambour Chronicle.**] Australian Sugar Jour. 12: 291. 1920.—The writer notes the effect of frost on sugar cane during the past 18 years, and states that an early frost is most serious to cane to be cut during the oncoming crushing season. Cane that is intended to stand over is injured according to the forwardness of growth, for while the younger and later plants may be injured more severely, the tops fall over and form a protection for the new growth. In 1908 the writer had a crop, estimated to cut 18 tons per acre, injured by frost which he let stand over, with the result of a gain the next season of over 22 tons per acre in 1910 freezing increased the yield from a 50 ton estimate to 124 tons actually cut in 1911.—*E. Koch.*

1405. BARBER, C. A. **The growth of the sugar cane. No. VIII.** Internat. Sugar Jour. 22: 442–446. *3 pl., 5 fig.* 1920.—Thickness of cane within certain limits is fixed for each variety. Ordinary sugar cane in the field will have a thickness of from 1½ to 2 inches, but there are two classes in which these limits are overstepped. "Elephant" canes, 2 to 3 inches

in thickness, do not grow very tall, do not fall easily, and are resistant to commoner cane diseases. In contrast to these are the varieties indigenous in India, which are less than an inch in thickness and have a thick tough rind and much fiber. Canes are divided into three classes: Ukl, thin and fibrous, with sweet juice; Paunda, 1½ to 2 inches in diameter; Ganna, ½ to 1 inch in diameter, with less fiber and more juice than the Ukl canes, juice poor in quality, less hardy and more liable to disease. Author gives description of the habits of growth of the cane and points out that in some cases the shape of the joints has been useful in determining the male parentage of unbagged seedlings. Experiments have shown a well-defined tendency toward the more slender seedlings being slightly richer in juice than the thicker ones.—*E. Koch.*

1406. Blair, R. E. **The work of the Yuma reclamation project experiment farm in 1918.** U. S. Dept. Agric. Dept. Circ. 75. *77 p. Fig. 1–32.* 1920.—A discussion of crop conditions, cotton variety tests and ratooning, cotton thinning, time of planting, breeding; variety tests for alfalfa, grain sorghums, flax, velvet beans, horse beans, forage sorghums, giant Bermuda grass, deciduous and citrus fruits, vegetables, ornamental trees and shrubs.—*L. R. Hesler.*

1407. Blaringhem, L. **Production par traumatisme d'une forme nouvelle de mais à caryposes multiples, Zea Mays var. polysperma.** [The traumatic origin of a new form of maize with multiple fruits, Zea Mays var. polysperma.] Compt. Rend. Acad. Sci. Paris **170**: 677–679. 1920.

1408. Calvino, Mario. **"Jack bean" y "sword bean" o sean los frijoles "canavali."** [Jack beans and sword beans are Canavali beans.] Revist. Agric. Com. y Trab. **3**: 57–61. *5 fig.* 1920.—Analyses of the "Jack bean," *Canavalia ensiformis,* and "sword bean," *Canavalia gladita,* are given, and they are recommended for trial in Cuba.—*F. M. Blodgett.*

1409. Calvino, Mario. **El zacate prodigio (Tripsacum latifolium Hitchcock).** [The grass marvel, Tripsacum latifolium.] Revist. Agric. Com. y Trab. **3**: 62–67. *6 fig.* 1920.—This perennial grass had its origin in Mexico. A botanical description is given. It is propagated by cuttings and produces forage having a comparatively high protein content for a grass, according to the analysis given. It is attacked by the rust *Puccinia polysora,* which causes little damage when the crop is cut at six month intervals.—*F. M. Blodgett.*

1410. Espino, Rafael B. **A review of the coconut investigations at the College of Agriculture.** Philippine Agric. **8**: 161–178. 1919.

1411. Garnier, M. **Plantes nouvelles pour 1920.** [New plants for 1920.] Rev. Hortic. [Paris] **92**: 34–35. *Fig. 9–10.* 1920.—See Bot. Absts. 6, Entry 1849.

1412. Gautier, Armand and P. Clausmann. **Action des fluorures sur la végétation: B. Cultures en champ d'expériences.** [Action of fluorides on vegetation; experimental field trials.] Compt. Rend. Acad. Sci. Paris **169**: 115–122. 1919.—See Bot. Absts. 6, Entry 1998.

1413. Hansen, Dan. **The work of the Huntley reclamation project experiment farm in 1918.** U. S. Dept. Agric. Dept. Circ. 86. *32 p., 5 fig.* 1920—Experiments on crop rotation are described. Results of variety tests for corn and barley given and notes on fruit trees recorded.—*L. R. Hesler.*

1414. Hansen, Albert A. **Cocklebur.** U. S. Dept. Agric. Dept. Circ. 109. *6 p., 1 fig.* 1920.—Distribution, description, and uses of cocklebur (*Xanthium* spp.) are given. Notes on damage and eradication measures are also presented.—*L. R. Hesler.*

1415. Harlan, Harry V. **Daily development of kernels of Hannchen barley from flowering to maturity at Aberdeen, Idaho.** Jour. Agric. Res. **19**: 393–429. *Pl. 83–91, 17 fig.* 1920.—Records were taken at intervals of 12 hours. Appreciable differences occur in these intervals except near maturity. The time from flowering to maturity for 3 successive years was 26

days. Growth in length is completed by the seventh day, and as soon as the rate of growth in length decreases, the thickness shows its most rapid increase. The dorsiventral diameter increases almost until maturity.—Increase in dry matter and decrease in percentage of water are very uniform throughout the period of growth. During growth the carbohydrates increase most rapidly and the ash content least rapidly.—"There are several well-marked steps in development. About the fifth or sixth day after flowering the growth in length is checked, and a rapid gain in dry matter begins. About the ninth or tenth day a sticky substance is secreted, which causes the glumes to adhere to the kernel. About the fifteenth or sixteenth day the kernel toughens, the lemma begins to lose color in the dorsal surface, some of the awns drop off, and the kernel has reached its maximum water content."—*D. Reddick.*

1416. Harlan, Harry V., and Stephen Anthony. **Development of barley kernels in normal and clipped spikes and the limitations of awnless and hooded varieties.** Jour. Agric. Res. 19: 431–472. *13 fig.* 1920.—Experiments in clipping awns of Hannchen and Manchuria barleys showed that at maturity both lateral and dorsiventral diameters of kernels from clipped spikes are smaller than those of normal spikes. This is not due to wound effects since rate of growth in clipped spikes is normal until the latter half of the growth period. The function of the awn as a transpiration organ is indicated by yields of awned and awnless sorts in arid as contrasted with humid areas. Awnless and hooded barleys shatter more easily than awned sorts. Clipped spikes also shatter easily. The authors find that the ash constituents that normally go into the awn are deposited in the rachis instead. They conclude that since the awn is removed it cannot function as a storage organ, and the consequent deposition of ash in the rachis causes brittleness. High yielding hooded or awnless sorts can hence be expected only by selection or hybridization in strains having low ash content in the rachis. They suggest the substitution of smooth awned varieties as lacking the objectionable features of the rough awned sorts.—*F. P. Bussell.*

1417. Headley, F. B. **The work in 1918 of the Newlands (formerly the Truckee-Carson) reclamation project experiment farm.** U. S. Dept. Agric. Dept. Circ. 80. *18 p., 1 fig.* 1920.—Discussion of variety and cultural tests of field crops, as alfalfa, barley, corn, oats, wheat and potatoes, and reports of results of experiments in the reclamation of alkali soil. Data are given concerning various horticultural crops, including sweet corn and string beans, and the blossoming periods of various fruit trees.—*L. R. Hesler.*

1418. Henke, L. A. **Corn at the College of Hawaii Farm.** Hawaiian Forester and Agric. 16: 40–45. 1919.—The failure of the ordinary American varieties of corn on the lower lands of the territory led to this attempt to find or develop a variety which would prove a sure crop on the low lands. Cuban corn was the outstanding variety. The variety does not possess an absolute immunity to leaf hoppers, but in only a few cases did they materially lessen the yield. An additional advantage lay in the fact that the husks surrounded the ears so completely and so tightly that bird or weevil injury did not appear until long after maturity, even in fields not harvested. In a country where the grain weevil is so common as in Hawaii, this is an extremely valuable characteristic. The yields ran from 30 to 57 bushels per acre, the larger yields appearing in the October plantings. Next in value came the Guam corn, which has been grown successfully on the Island of Kauai for some years. As the husks of this variety tend to open before the ears mature, it is more liable to bird and weevil injury than is the Cuban corn.—*Stanley Coulter.*

1419. Hibbard, R. P., and S. Gershberg. **The biological method of determining the fertilizer requirement of a particular soil or crop.** Michigan Acad. Sci. Ann. Rept. 21: 223–224. 1919.—Since the fertilizer requirement of a crop can not be determined by an analysis of either the soil or the crop, the requirement must be studied by growing the crop on the particular soil. This is called the biological method. Attention is called to the fact that the great majority of fertilizer experiments have not been planned on a logical, systematic method and that the combinations of fertilizer salts have been greatly restricted, and selected at random. The triangular system is advocated for field work. Field studies have been going

on for several years. Different soils and different crops have been investigated. It is suggested that plants growing for three or four weeks in pot cultures in the greenhouse could be used, according to the plan devised, to determine the proper treatment of the soil in the field. This work could be done in the winter months. Truck growers who use large greenhouses have an excellent chance to test out the proposed method. The article concludes with emphasizing the necessity of improving the present practice in the utilization of fertilizer in plant production. More exact knowledge is needed as to the best salts to combine and as to the best ratios of these salts.—*H. C. Young.*

1420. Jenkins, E. H., W. L. Slate, D. F. Jones, and B. A. Brown. **Varieties and strains of corn for Connecticut.** Connecticut (New Haven) Agric. Exp. Sta. and Storrs (Connecticut) Agric. Exp. Sta. Joint Bull. 3. *15 p.* 1919.—A report of progress in testing the prominent varieties and strains of corn for yields of grain and silage.—*Henry Dorsey.*

1421. Judd, C. S. **Morning glory weed.** Hawaiian Forester and Agric. 16: 4–5. 1919.—Notes occurrence of this pest in two localities along Kahului Railway. The area involved is very small, and efforts to bring about the complete eradication of the weed will probably prove successful.—*Stanley Coulter.*

1422. Leape, H. M., and H. E. Annett. **Investigations concerning the production of Indian opium for medical purposes.** Agric. Jour. India 15: 124–134. 1920.—A study was made of the morphine content of different varieties of opium grown under varying climatic conditions. Nitrogenous substances were the only fertilizing materials which resulted in increased production. Sodium nitrate increased the size of capsules and the amount of latex, but did not increase the percentage of morphine in the opium. The number of capsules borne on a plant is correlated with the morphine content of the opium produced. The terminal capsules are richer in morphine than the lateral ones, the difference varying from 2 to 7 per cent. About 500 varieties were examined for their morphine content and were found to vary from 6.5 to 20.5 per cent. The material produced from the first lancings of the poppy capsules had a higher morphine content than that produced from succeeding lancings.—*J. J. Skinner.*

1423. Letteer, C. R. **The work of the San Antonio experiment farm in 1918.** U. S. Dept. Agric. Dept. Circ. 73. *38 p., 4 fig.* 1920.—The report includes discussion of topics as follows: Crop conditions; effect of rotation and tillage on cotton root-rot; experiments with and notes on cotton, corn, oats, Sudan grass, cowpeas, sorghums, flax, bean varieties, Rhodes grass, fruits and ornamental plantings; experiments in cotton root-rot control, under the headings, soil treatment, mulches, and excavations.—*L. R. Hesler.*

1424. Lovejoy, P. S. **Farms vs. forests.** Michigan Acad. Sci. Ann. Rept. 21: 201–212. 1919.—See Bot. Absts. 6, Entry 1559.

1425. Nelson, J. C. [Rev. of: Hitchcock, A. S. **The genera of grasses of the United States, with special reference to the economic species.** U. S. Dept. Agric. Bull. 772. *307 p., 20 pl., 174 fig.* Government Printing Office: Washington, 1920. Price $.40.] Torreya 20: 84–88. 1920.

1426. Parmentier Paul. **Les irrigations et les arrosages en Syrie et en Palestine.** [**Irrigation in Syria and Palestine.**] Compt. Rend. Acad. Sci. Paris 169: 391–393. 1919.—See Bot. Absts. 6, Entry 1829.

1427. Parry and Company. **The development of cane planting by the East India distilleries and sugar factories.** Agric. Jour. India 15: 154–159. *2 pl.* 1920.—The yield and purity of sugar produced by a number of varieties of cane are given. The variety "Fiji B" produced 48 tons per acre, which was the largest yield secured. The purity of the sugar from this variety was also highest.—*J. J. Skinner.*

1428. PIPER, C. V. **Kudzu.** U. S. Dept. Agric. Dept. Circ. 83. *7 p., 2 fig.* 1920.—Description of kudzu (*Pueraria thunbergiana*) with a discussion of culture, grazing and feeding value.—*L. R. Hesler.*

1429. PIPER, C. V. **The jack bean.** U. S. Dept. Agric. Dept. Circ. 92. *12 p., 1 fig.* 1920. —A general discussion of the history, appearance, botany, culture, and pests of the jack bean (*Canavalia ensiformis*).—*L. R. Hesler.*

1430. RINDL, M. **Vegetable fats and oils. III. Drying oils (continued).** South African Jour. Inst. 3: 256–265. 1920.—Article treats of the sunflower, mainly in reference to its oil. The culture, soil preferences, varieties, harvesting, and utilization are discussed, and analyses of South African grown seeds are given. The culture of the plant in Rhodesia is also discussed in reference to effect of fertilizers, and use as a rotation crop with maize. Some commercial data regarding sunflower seeds are included. Brief notes are also added concerning *Madia sativa.*—*C. V. Piper.*

1431. SCHREINER, OSWALD, B. E. BROWN, J. J. SKINNER, AND M. SHAPOVALOV. **Crop injury by borax in fertilizers.** U. S. Dept. Agric. Dept. Circ. 84: 3–35. *25 fig.* 1920.—(Report on investigations (field and greenhouse) of the effects of anhydrous borax in potato and cotton fertilizers. "Practically all the evidence collected points to the use in fertilizers of potash salts containing borax in what proved in practice to be excessive quantities. The higher the potash content of such mixed fertilizers the higher was also the borax content and the greater the damage to the crop." The appearance of the injury to potatoes and cotton is thus described: "In slight cases the foliage is lighter green than normal, while severely affected plants show leaves slightly rimmed, like a pond-lily leaf, this rim being bleached white or yellowish, so that the effect of borax-containing fertilizers has been rather aptly called 'gilt-edged.' In more extreme cases the leaves may be completely bleached, but they are rarely found in the field, as such badly affected plants die soon after emerging from the soil. With wheat and corn this bleached leaf is the more usual characteristic. It is not thought that permanent damage has resulted on fields subjected to this borax trouble. "There may be a cumulative effect, but there is no evidence on this question." Should borax continue to be used as an ingredient of fertilizer materials, even in moderate quantities, it will become an important duty of those responsible for fertilizer experimentation to test this possible cumulative action by a well planned long-term fertilizer experiment." Studies indicate that 2–3 pounds of borax to the acre will injure wheat and 8–9 pounds affect cotton. These quantities are small when compared to those of other poisons, as arsenic, mercury and copper. The extremely poisonous action is not readily explained. Borax is a strong antiseptic, and a partial explanation might be sought in the sterilizing action which it may have on the soil, but the authors think the specific physiological reactions of the plant would suggest a more intimate connection with the growing functions of the plant itself. Possibly borax also interferes with the liberation of sugars, thus disturbing the processes of germination and growth. Borax may also prove to be antizymotic. Notes on general conditions of health of potatoes in Maine are given.—*L. R. Hesler.*

1432. RYAN, P. **Flax and its cultivation.** Jour. Dept. Agric. Victoria 18: 257–266. 1920. —Cultural requirements, seeding, manuring, and harvesting are discussed. Up to the present flax has been grown in Australia for fiber exclusively.—*J. J. Skinner.*

1433. TRUAX, HARTLEY E. **United States grades for potatoes.** U. S. Dept. Agric. Dept. Circ. 96: 2–4. 1920.

1434. TRUAX, HARTLEY E. **United States grades for sweet potatoes recommended by the United States Department of Agriculture.** U. S. Dept. Agric. Dept. Circ. 99: 2–4. 1920.

1435. Venkatraman, T. S. **Packing seed sugar canes for transport.** Agric. Jour. India 15: 174–180. *3 pl.* 1910.—Directions for packing are given, together with a general discussion.—*J. J. Skinner.*

1436. Westover, H. L. **The development of the Peruvian alfalfa industry in the United States.** U. S. Dept. Agric. Dept. Circ. 93. *8 p., 2 fig.* 1920.

## BIBLIOGRAPHY, BIOGRAPHY AND HISTORY

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1437. Anonymous. **Casimir de Candolle.** Kew Bull. Misc. Inf. [London] 1919: 237–238. 1919.

1438. Anonymous. **Dr. Frank Shipley Collins.** Rhodora 22: 96. 1920.—Notice of the death of this former president of the New England Botanical Club and member of the Editorial Staff of Rhodora, on May 25 at New Haven, Connecticut, in his seventy-third year.—*James P. Poole.*

1439. Anonymous. **Mrs. M. A. Sargent.** Kew Bull. Misc. Inf. [London] 1919: 390. 1919.

1440. Anonymous. **A Shakespearean garden.** Nature 104: 441–442. 1920.—Note upon plan to restore the garden of Shakespeare's birthplace with the flowers of his period. Comment upon suitable plants, and reference to some publications containing pertinent information.—*O. A. Stevens.*

1441. Anonymous. **Prof. J. W. H. Trail.** Kew Bull. Misc. Inf. [London] 1920: 32–33. 1920.—Additions to the list of publications by Trail given in Kew Bull. 1919: 381.—*E. Mead Wilcox.*

1442. Anonymous. **John H. Wilson.** Kew Bull. Misc. Inf. [London] 1920: 71. 1920.

1443. Barber, C. H. **The origin of sugar cane.** Internat. Sugar Jour. 22: 249–251. 1920.

1444. Bessey, E. A. **Guide to the literature for the identification of fungi—a preliminary outline for students and others.** Michigan Acad. Sci. Ann. Rept. 21: 287–316. 1919.—See Bot. Absts. 6, Entry 1911.

1445. Borén, P. G. **Utgifningsåren af Svensk Botanik [Dates of publication of "Svensk Botanik."]** Bot. Notiser [Lund] 1920: 63–64. 1920.—The year of publication is given for each part of each volume of the illustrated work, together with the numbers of the plates contained in each.—*P. A. Rydberg.*

1446. Correvon, H. **L'horticulture russe sous le régime bolcheviste. [Russian horticulture under the bolshevist régime.]** Rev. Hortic. [Paris] 92: 18–19. 1920.—General discussion concerning the fate of individuals. Destruction and neglect of some of the more important botanic gardens.—*E. J. Kraus.*

1447. Coulter, J. M. **Aaron Aaronsohn.** Bot. Gaz. 68: 388–389. *1 fig.* 1919.—A short biographical sketch with portrait.—See also Bot. Absts. 6, Entry 904.

1448. D(unn), S(tephen) T. **William James Tutcher.** Kew Bull. Misc. Inf. [London] 1920: 136–138. 1920.

1449. Eberle, E. G. **Henry George Greenish. Sketch with portrait.** Jour. Amer. Pharm. Assoc. 9: 665–666. 1920.

1450. Freeman, W. E. **British botanic gardens and stations.** Nature 104: 469. 1920.—Reference to early desire for such work in the West Indies shown in 1762 and the foundation of the St. Vincent garden.—*O. A. Stevens.*

1451. Fries, Rob. E. **Några drag ur den Bergianska trädgårdens historia 1885–1914. [Some outlines from the history of Hortus Bergianus 1885–1914.]** Acta Horti Bergiani [Stockholm] 6[1]: 5–24. *106 pl., 2 maps.* 1918.

1452. [Fries, Rob E.] **Veit Brecher Wittrock. In memoriam.** Acta Horti Bergiani [Stockholm] 6[1]: 3. 1918. Portrait.

1453. G(rove), W. B. **George Stephen West.** Kew Bull. Misc. Inf. [London] 1919: 314–315. 1919.—See also Bot. Absts. 6, Entry 56.

1454. Lesourd, F. **Les plantes potagères à travers les âges.** [Culinary plants grown in various centuries.] Rev. Hortic. [Paris] 92: 12–13. 1920.—See Bot. Absts. 6, Entry 1157.

1455. Lloyd, C. G. **J. Ramsbottom.** Mycological Notes 57: 830. April, 1919. [Cincinnati, Ohio.]—A biographical sketch with portrait.

1456. Lloyd, C. G. **Arthur Lister.** Mycological Notes 58: 814. March, 1919. [Cincinnati, Ohio.]—A biographical sketch with portrait.

1457. Lloyd, C. G. **George Francis Atkinson.** Mycological Notes 59: 846. June, 1919. [Cincinnati, Ohio.]—A biographical sketch with portrait.

1458. MacCaughey, V. M. **History of Botanical Exploration in Hawaii.** Hawaiian Forester and Agric. 16: 25–28. 1919. Sketches of work of Asa Gray and Brackenlidge in connection with U. S. Exploring Expedition; of Didrichsen's visit in 1845–47, his collections in the main being now at Copenhagen; of Berthold Seemann, whose name will always be associated with the botany of the Pacific, who visited the Islands on the voyage of the "Herald," 1847–51; of Jules Rémy who, in his two visits, 1851–63, made notable collections of the Hawaiian flora; of Mann and Brigham in 1864–65; and finally of Wawra, the botanist of the Austrian East Asiatic Exploring Expedition of 1869. Valuable because of bibliography and location of collections.—*Stanley Coulter.*

1459. MacCaughey, V. M. **History of Botanical Exploration in Hawaii.** Hawaiian Forester and Agric. 16: 49–54. 1919.—A conclusion of the series of articles together with a complete bibliography. Especial attention is given to the work of William Hillebrand, "Hawaii's greatest botanist." Others included are Rev. J. M. Lydgate, Edward Bailey, A. A. Heller, H. Schauinsland, and Miss Josephine Tilden. The fifty-two titles in the bibliography include "A Voyage to the Pacific Ocean," Captain James Cook (1784); "Voyage autour du monde," M. Marchand (1798); and Vancouver's "A Voyage of Discovery to the North Pacific Ocean and around the World" (1798).—*Stanley Coulter.*

1460. McFarland, J. Horace. **Roses remade for America.** Garden Mag. 31: 93–98. 1920.—See Bot. Absts. 6, Entry 1168.

1461.—Mackenna, J. **Dr. C. A. Barber.** Agric. Jour. India 15: 11–15. *1 pl.* 1920.—Life history.

1462. Mangin, Louis. **Notice nécrologique—Émile Boudier.** [Obituary of Emile Boudier.] Compt. Rend. Acad. Sci. Paris 170: 417–418. 1920.—Mycologist, 1828–1920; pupil of Levéille; specialist in Discomycetes; doctor of pharmacy; residence at Montmorency.—*C. H. and W. K. Farr.*

1463. Mangin, L. **Notice sur M. William Gilson Farlow.** [**Note concerning William Gilson Farlow**]. Compt. Rend. Acad. Sci. Paris **169**: 445–448. 1919.—A review of the life and works of William Gilson Farlow. [See also Bot. Absts. 6, Entries 916, 947, 956, 963, and 1470.]—*V. H. Young.*

1464. [Nordstedt, O.] [Rev. of: Bryk, F. **Caroli Linnaei Adonis Stenbroensis.** *xiii*+ *28 p., 2 maps.* 1920.] Bot. Notiser [Lund] **1920**: 61. 1920.—The printing of an unpublished manuscript of Linnaeus—a catalogue of the plants growing in his father's garden—written in 1731 and 1732.—*P. A. Rydberg.*

1465. Nordstedt, O. **Prima loca plantarum Suecicarum.** Bot. Notiser [Lund] **1920** (Bilaga): 1–64. 1920.

1466. Phillips, E. P. **A brief analysis of the work of Carl Thunberg on the Proteaceae.** South African Jour. Sci. **16**: 380–382. 1920.—Thunberg collected 79 species of Proteaceae, but recognized only the genera *Protea* and *Brabieum.* Thunberg described 84 species.—*E. P. Phillips.*

1467. Ritzema Bos, J. **Bij den aanvang van den 26 sten jaargang.** [**Beginning the twenty-sixth year of the Tijdschrift.**] Tijdschr. Plantenz. **26**: 1–4. 1920.—An editorial announcement. The Tijdschrift is to appear monthly instead of bi-monthly as in the past. It is to be the semi-official organ of the Phytopathological Service of Holland. A complete index of the first 25 volumes of the Tijdschrift is to be published. Authors and titles of a number of leading articles to appear in volume 26 are given, and an appeal is made for increased membership in the society and funds for the journal.—*H. H. Whetzel.*

1468. Russell, E. J. **Dr. Cyril G. Hopkins.** Nature **104**: 442–44 . 1920.—Reference to his death and brief survey of his work.—*O. A. Stevens.*

1469. S(kan), S(idney) A(lfred). **Sir William MacGregor.** Kew Bull. Misc. Inf. [London] **1920**: 31–32. 1920.

1470. W(akefield), E(lsie) M(aud). **William Gilson Farlow.** Kew Bull. Misc. Inf. [London] **1919**: 388–390. 1919.—See also Bot. Absts. 6, Entries 916, 947, 956, 963 and 1463.

1471. Wilson, E. H. **The romance of our trees. VII. The beeches.** Garden Mag. **31**: 115–119. *4 fig.* 1920.—Discusses history, distribution, characteristics of the different species, mentions celebrated specimens, celebrated groves and forests of beeches.—*H. C. Thompson.*

1472. Wilson, E. H. **The romance of our trees. IX. Whence came the common fruits.** Garden Mag. **31**: 259–263. 1920.—Discusses the origin of apples, pears, peaches, plums, cherries, and apricots.—*H. C. Thompson.*

1473. Wilson, E. H. **The romance of our trees. X. The Lombardy poplar and the Babylon willow.** Garden Mag. **31**: 317–320. *5 fig.* 1920.

## BOTANICAL EDUCATION

C. Stuart Gager, *Editor*
Alfred Gundersen, *Assistant Editor*

1474. Anonymous. **Kursus for Skogbrukslärlinge.** [**Courses of study for beginners in forestry.**] Tidsskr. Skogbruk **28**: 123–125. 1920.—Announcement of establishment, organization, and administration of the schools. No list of courses.—*J. A. Larsen.*

1475. Anonymous. **Tropical agricultural college in the West Indies.** Kew Bull. Misc. Inf. [London] **1920**: 81–96. 1920.

1476. Brown, Elizabeth Dorothy Wuist. **The value of nutrient solutions as culture media for fern prothallia.** Torreya 20: 76–83. *2 fig.* 1920.—The work of growing fern prothallia for class use is greatly simplified by the use of nutrient solutions. The following were found useful in the germination and development of various Polypodiaceae; Beijerinck's, Birner and Lucanus's, Knop's, Prantl's, Sachs's. The composition of each is indicated. It is best to make a liter of the solution, which it is not necessary to sterilize. Glass capsules holding about 26 cc. are best suited for solution cultures. Ferns with monoecious prothallia are best adapted for the work. After drying, the sporangia are crushed and the spores separated with bolting-cloth. After the cultures are made, they should be exposed to direct sunlight. The optimum temperature for prothallia is 60° F.—*J. C. Nelson.*

1477. Phillips, E. P. **The importance of a properly equipped state herbarium to an agricultural country.** South African Jour. Nat. Hist. 2: 18–39. 1920.

## CYTOLOGY

Gilbert M. Smith, *Editor*
G. S. Bryan, *Assistant Editor*

1478. Allen, Ezra. **Studies on cell division in the albino rat (Mus norvegicus var. alb.). III. Spermatogenesis: the origin of the first spermatocytes and the organization of the chromosomes, including the accessory.** Jour. Morph. 31: 133–185. *58 fig.* 1918.—See Bot. Absts. 5, Entry 1421.

1479. Church, A. H. **Historical review of the Florideae. II.** Jour. Botany 57: 329–334. 1919. (Continued from Ibid. 57: 304.)—See Bot. Absts. 5, Entry 598.

1480. Conklin, E. J. **The mechanism of evolution.** Sci. Monthly 10: 392–403, 496–515. 1920.—See Bot. Absts. 5, Entries 1986, 1987.

1481. Dangeard, P. A. **La structure de la cellule végétale et son métabolisme.** [The structure of the plant cell and its metabolism.] Compt. Rend. Acad. Sci. Paris 170: 709–714. 1920.—A comparison of the three categories of chondrial elements of Guilliermond with the three categories of the author. He criticizes Guilliermond for including under the term mitochondria all cell elements giving the mitochondrial reaction, regardless of their origin or development. He repeats his contention that anthocyan and tannins are formed from the metachromatic bodies of the vacuome.—*C. H.* and *W. K. Far.*

1482. Delage, Y., and M. Goldsmith. **Le mendelisme et le mécanisme cytologique de l'hérédité.** [Mendelism and the cytological mechanism of heredity.] Rev. Sci. Paris 57: 97–109, 130–135. 1919.—See Bot. Absts. 5, Entry 1483.

1483. De Winiwarter, H. **Les mitoses de l'épithélium séminal du chat.** [Mitoses of the seminal epithelium of the cat.] Arch. Biol. 30: 1–87. *1 pl., 34 fig.* 1919.—See Bot. Absts 5, Entry 351.

1484. Doncaster, L., and H. G. Cannon. **On the spermatogenesis of the louse (Pediculus corporis and P. capitis), with some observations on the maturation of the egg.** Quart. Jour. Microsc. Sci. 64: 303–328. *1 pl., 1 fig.* 1920.—See Bot. Absts. 5, Entry 1489.

1485. Gatenby, J. Bronté. **The cytoplasmic inclusions of the germ-cells. VI. On the origin and probable constitution of the germ-cell determinant of Apanteles glomeratus, with a note on the secondary nuclei.** Quart. Jour. Microsc. Sci. 64: 133–153. *1 pl., 10 fig.* 1920.—See Bot. Absts. 5, Entry 378.

1486. Goldsmith, William M. **A comparative study of the chromosomes of tiger beetles (Cicindelidae).** Jour. Morph. 32: 438–487. *Pl. 1–10.* 1919.—See Bot. Absts. 5, Entry 382.

1487. Guilliermond, A. **Sur le chondriome et les formations ergastoplasmiques du sac embryonnaire des Liliacées. [On the chondriosome and the ergastoplasmic formations of the embryosac of lilies.]** Compt. Rend. Acad. Sci. Paris **169**: 300–303. *4 fig.* 1919.—Author figures and describes the formation and nature of mitochondria, chondriosomes, and "ergastoplasmic" bodies in the embryo-sac of *Lilium croceum* and *L. candidum.*—*V. H. Young.*

1488. Lillie, Frank Rattray. **Problems of fertilization.** *13 × 19 cm., xii + 278 p., 19 fig.* Univ. Chicago Press: Chicago, 1919.—See Bot. Absts. 5, Entry 410.

1489. Metz, Chas. W. **Correspondence between chromosome number and linkage groups in Drosophila virilis.** Science **51**: 417–418. 1920.—See Bot. Absts. 5, Entry 1582.

1490. Miller, E. C. **Development of the pistillate spikelet and fertilization in Zea mays L.** Jour. Agric. Res. **18**: 255–265. *Pl. 19–32.* 1919.—See Bot. Absts. 5, Entry 569.

1491. Morgan, T. H. **The physical basis of heredity.** *14 × 21 cm., 300 p., 117 fig.* J. B. Lippincott Co.: Philadelphia, 1919.—See Bot. Absts. 5, Entry 422.

1492. Morgan, T. H., and C. B. Bridges. **Contributions to the genetics of Drosophila melanogaster. I. The origin of gynandromorphs.** Carnegie Inst. Washington Publ. **278**. *122 p., 4 pl., 10 fig.* Washington, D. C. 1919.—See Bot. Absts. 5, Entry 424.

1493. Nakahara, Waro. **A study on the chromosomes in the spermatogenesis of the stone-fly, Perla immarginata Say, with special reference to the question of synapsis.** Jour. Morphol. **32**: 509–529. *3 pl.* 1919.—See Bot. Absts., 5, Entry 429.

1494. Schaffner, J. H. **The expression of sexual dimorphism in heterosporous sporophytes.** Ohio Jour. Sci. **18**: 101–125. *25 fig.* 1918.—See Bot. Absts. 5, Entry 1627.

1495. van Wisselingh, C. **Über Varibilität und Erblichkeit. [Concerning variability and heredity.]** Zeitschr. indukt. Abstamm. Vererb. **22**: 65–126. *10 fig.* 1920.—See Bot. Absts. 5, Entry 1679.

1496. Zeleny, C. **The method of procedure in the analysis of heredity.** Sci. Monthly **11**: 263–275. 1920.

## ECOLOGY AND PLANT GEOGRAPHY

H. C. Cowles, *Editor*
Geo. D. Fuller, *Assistant Editor*

### GENERAL, FACTORS, MEASUREMENTS

1497. Brenchley, Winifred E. **Some factors in plant competition.** Ann. Appl. Biol **6**: 142–170. *Pl. 5, 10 fig.* 1919.—The writer, at the Rothamsted Station, used barley and mustard plants in a study of competition for food from the soil, for water, and for light. When the food supply is limited, the amount of nitrogen was found to determine the amount of growth, and the dry weight was found to be about the same per pot, regardless of the number of plants grown.—When there is competition for light in overcrowding, barley plants produced a smaller number of ears, an irregular number of tillers, a reduced amount of dry matter, and a proportionately larger ratio of shoot growth as compared with root growth. Crowded plants had a decreased power of utilizing the food supplied to the roots. Adequately illuminated barley plants tended to grow toward a standard type of plant. With crowding, this approximation to a standard disappeared.—*G. R. Bisby.*

1498. Cribbs, James E. **Ecology of Tilia americana. I. Comparative studies of the foliar transpiring power.** Bot. Gaz. **68**: 262–286. *13 fig.* 1919.—In the dune region of Indiana *Tilia americana* is found growing in a variety of habitats ranging from mesophytism to rather

extreme xerophytism. Cribbs has measured the factors of these habitats, including temperature, evaporation, humidity, soil moisture, and soil temperature, and has presented his results in a series of graphs exhibiting the range of mesophytism characteristic of the different habitats. In each of these habitats he has measured the foliar transpiring power of leaves of the same age and similar position, using the cobalt chloride paper method. These results are presented in graphs which express as some of the most notable of the results: (1) The foliar transpiring power increases from that indicated by an index of 0.15 in the mesophytic forest situation to that with an index of 0.55 in the most exposed situation on the open sand. (2) In the forest the daily march of relative transpiration is represented by a curve with a single mode developing about midday and coinciding with the maxima of temperature, relative humidity, and evaporating power of the air. (3) In more exposed situations the transpiration curve becomes bimodal, with the maximum appearing earlier in the day than the maxima of temperature, relative humidity, and evaporation. (4) The second mode developing in the afternoon is always lower than the mode preceding the depression due to saturation deficit. (5) No evidence of visible wilting occurred in *Tilia* on the open sand at any time during the summer, although the so-called "incipient drying" was a common feature of the stations throughout this period. On the forested complex, however, visible wilting occurred during the first week of August because the vegetation was so dense that the water content of the soil was reduced quite early to a point below the wilting coefficient. (6) The amount of water in the soil apparently has very little influence on the transpiration index unless it is reduced to the wilting coefficient. The saturation deficit depression is due to the inability of the translocating system to conduct water to the leaves with sufficient rapidity to offset the transpiration loss—*Geo. D. Fuller.*

1499. Gleason, Henry Allan. **Some applications of the quadrat method.** Bull. Torrey Bot. Club 47: 21–33. 1920.—The quadrat method constitutes the only practical means for quantitative study of the plant association and is of great importance in correcting the deficiencies of written description and photography. There are quadrats of various types: a simple list of species, the number of individuals of each species, and the map type in which a chart is prepared on scale. A single quadrat is apt to give a one-sided picture of an association because of lack of homogeneity within the association; the chief value in this method, then, lies in the use of many quadrats, the size of which must be determined by the general character of the vegetation. The first quadrat used can be located anywhere; succeeding ones can be at definite distances from the first to avoid personal choice. At the conclusion of the count, the ratio between the total number of quadrats and the number in which a given species occurs is expressed as a percentage which is known as the *frequency index* (FI). Some rarer species will thus be missed entirely, but those of actual importance in the association will be counted. There is a definite relation between the number of individuals of a species and its frequency index. If $n$ plants are scattered at random over $q$ quadrats the probability of any one quadrat being occupied is expressed by the formula $1 - \left(\frac{1-1}{q}\right)^n$. But since plants are not distributed entirely at random, the actual number is greater than indicated by the mathematical formula. Since the frequency index increases with the size of a quadrat, a *major quadrat* may be chosen which will normally include all the more important species. The proper size of this major quadrat may be determined by reducing the original series of quadrats to a smaller number of larger ones by substituting in the formula $FI = 1 - (1 - \frac{1}{q})^n$, for $q$ the number of quadrats actually counted, and for $FI$ the index of the least common of the important species. Jaccard's *community coefficient* is shown to be unsatisfactory in allowing equal weight to small slender plants and to larger ones; it might be improved by a multiplier expressive of size.—*P. A. Munz.*

1500. McLean, R. C. **Studies in the ecology of tropical rain forests, with special reference to the forests of South Brazil.** Jour. Ecol. 7: 121–172. *10 fig.* 1919.—This report continues the account of the rain forest near Rio de Janeiro, Brazil, already noted (see Bot. Absts.

4, Entry 196). This forest is regarded as the climax type for a large portion of the adjacent country. A biological spectrum of the Raunkiaer type would show an enormous preponderance of woody plants arranged in three distinct strata, the ground cover being comparatively bare of herbaceous vegetation. There is a great diversity of species, with the Leguminosae as the most prominent family and the Rubiaceae and Piperaceae particularly abundant among the shrubs. Ferns and lycopods are largely limited to rocky spots. Conspicuous and highly colored flowers are abundant in the upper canopy and notably lacking below. Buttressed tree trunks are rare in spite of the frequency of violent winds but thorny stems are frequent even in large trees. The floristic diversity and the contrasting uniformity of appearance especially in leaf form are ascribed to (1) the antiquity of prevailing conditions and (2) the peculiarity of the environment. The soil is shallow and pervious, with a water holding capacity of about 40 per cent and an average water content of 10 per cent. It is deficient in mineral nutrient material, particularly in calcium carbonate. The humus content is about 3 per cent. Mycorhiza is very abundant. A very considerable amount of rain is intercepted by foliage and evaporated into the air, thus reducing the rainfall efficiency. Light measurements made with photographic exposure meters show the average ratio of the light outside and that within the deep forest to be 1: 0.06; some spectroscopic measurements, however, tend to show that the photosynthetic efficiency of the shade illumination is relatively greater than the actinic.—The leaves of the forest are in general characterized by their large size, the small number per plant, and the frequency of nyctitropic movements and of vertical position. The shade leaves show conspicuous water storing epidermis, reduced and undifferentiated mesophyll and occasional epidermal papillae. The leaf area of the sun foliage is approximately the same as that of the shade leaves, but the latter are decidedly larger and narrower. Red coloration is common in the young shade leaves, and such leaves are shown to have a higher rate of respiration. The percentage of carbon dioxide within the forest is shown to be high, and here light is doubtless the limiting factor of photosynthesis. —*Geo. D. Fuller.*

1501. Watt, A. S. **On the causes of failure of natural regeneration in British oakwoods.** Jour. Ecol. 7: 173–203. 1919.—The investigation was conducted in the vicinity of Cambridge England, and the report is presented in three parts, dealing respectively with the acorn, its germination, and the seedlings. The rapid disappearance of even a large crop of acorns from the forest floor is seen to be largely due to the action of rabbits and mice. The drying of the acorn to an extent that results in the loss of 20 per cent of its water is found to prevent subsequent germination. Experiments were conducted to discover the amount of imbedding in the soil necessary for good germination, and in general it was found that at least one-half of the nut should be below the surface; on the other hand burial to depths ranging from 3 to 9 inches in sandy or clay soil gave equally good germination. Rabbits, mice, and larger grazing animals are shown to destroy very large percentages of the seedlings during the first few years of their existence. One of the mildew fungi proved rather destructive, especially on the sandy soils. Emphasis is placed on the fact that by destroying carnivorous animals man has upset the balance of nature and favored the enemies of forest regeneration. The chances of good regeneration decrease on passing from the "damp oak association" to the "dry oak association," and from the latter to the "oak-birch heath."—*Geo. D. Fuller.*

## STRUCTURE, BEHAVIOR

1502. Betts, M. Winifred. **Notes on the autoecology of certain plants of the Peridotite Belt, Nelson [New Zealand]: Part I. Structure of some of the plants (No. 2).** Trans. and Proc. New Zealand Inst. 51: 136–156. *27 fig.* 1919.—The region studied is about thirty square miles in area, with a vegetation of xerophytic shrubs and grassland. A detailed description is given of the growth-forms, and of the anatomy of the leaf and of the stem, of fifteen characteristic plants.—*L. W. Riddle.*

1503. Harper, Roland M. **Water and mineral content of an epiphytic fern.** Amer. Fern Jour. 9: 99–103. 1919.—Epiphytic ferns probably get some of the inorganic matter from the bark of trees on which they grow as well as from dust. Three hundred and forty grams of *Polypodium polypodioides* were collected shortly after a rain. The plants were chopped up, and after remaining at a temperature of 46°C. for about a week were again weighed. The dry weight was about 42 per cent of the fresh weight. When some of the desiccated material was burned, it was found to contain 5 per cent ash. A partial analysis of the ash showed 27 per cent of potash and ½ of 1 per cent of soda.—*F. C. Anderson.*

1504. Haviland, F. E. **The stomata of the leafless plants of the interior [Australia].** Australian Nat. 4: 107–110. 1919.—The arrangement, number, and location of the stomates in a number of leafless plants of Australia. The stomates often appear to be unprotected against excessive transpiration.—*T. C. Frye.*

## VEGETATION

1505. Engler, A. **Die Vegetationsverhältnisse des Kongoa-Gebirges und der Bambuto-Berge in Kamerun [West Africa]. [The vegetation of the Kongoa Mountains and the Bambuto Mountain in Kamerun.]** Bot. Jahrb. 55 (Beiheft): 24–32. 1919.—Ledermann's Garua expedition (1908–09) had thrown much light on the relations of the alpine floras of western and eastern Africa. Engler wished to carry this study farther into the Kongoa and Bambuto Mountains.—Vegetation of the Kongoa Mts.: There are many plants of *Pachylobus edulis* in the forests of the foot-hills, also *Phoenix reclinata* and tree ferns. Above 1200 m. frequent fogs cause the trees to be covered with *Pilotrichella* and *Usnea*. The lianes are species of *Urera*, *Grewia*, etc. A list of plants in the forest at 1500 m. is given. The following are some of the epiphytes: *Polypodium lanceolatum*, *Oleandra articulata*, *Vittaria*, *Bulbophyllum*, *Viscum*, and *Megaclinium*. The forest floor is covered with Selaginellas, Peperomias, Polyspathas, Clinogynes, and other plants. On Mbo at an altitude of 1900 m. are fine examples of the Guinean rain forests; lists of the plants are given. Above Sanschu, at 1550 m. elevation, the forest becomes transformed into a pure stand of *Pennisetum purpureum* (elephant grass). On the declivities oil palms extend up to 1800 m. A list of the plants in the elephant-grass formation is given. Tree ferns are found on the stream banks here, according to Ledermann. This formation passes in drier situations to grass steppes with herbaceous Melastomaceae and other plants. At 1800 m. the alpine forest begins with low thin-stemmed gnarly trees and a few lianes, the most common of which is the araliaceous *Polyscias Preussii*. The typical plants on the eastern slope are listed. Vegetation of the Bambuto Mountains: From Djutitsa the trail leaves the culture-land and enters the grass steppes of the mountains. A list of plants is given of the Raphia region, where at the start this plant (*Raphia*) is common. The gradually rounded hills are covered with grass 1–1.5 m. high. A list of species in this grass formation at an altitude of 1700–1800 m. is given. Many of these plants have very beautiful flowers. At 2000 m. the steppe-flora becomes still more diverse, *Vigna Ledermannii*, *Polygala tenuicaule*, *Gmidia bambutana*, and other plants appearing. Especially rich are the mountain steppes at 2200 m. altitude. Here Ledermann discovered willows along the borders of brooks, and though these have been noted in a few other localities, this was an important geographical discovery. *Peucedanum Winkleri*, 2–3 m. high, is found here; also *Vernonia senegalensis*, 4–6 m. high. At 2000–3000 m. groups of Proteaceae appear. On the northwest slope at 2100–2300 m. is a low alpine forest. Here is found *Pteridium;* then *Vernonia senegalensis*. Labiatae, a 3 m. high *Lobelia*, *Spiraea*, *Ficus*, *Peperomia*, *Hypericum lanceolatum*, *Tephrosia*, and other plants gradually appear. Lianes and epiphytic orchids are rare in this region. At the edge of the forest, at an altitude of 1900–2500 m., *Ericinella mannii*, 5 m. high, is common and forms the Ericinella association. Here also is *Pteridium*, bushes of *Trifolium Goetzenii*, *Crotalaria oreadum*, *Calamintha sinensis*, and other species. In places very rich in humus *Hypericum Conrauanum*, 2–5 m. high, is found; also *Brillantaisia Schumanniana*, a splendid giant herb 4–5 m. high, *Impatiens Sakeriana*, and others. In dry open places the ericaceous *Blaeria bambutensis* appears.

In the primary forests of the gullies more lianes and more ferns are found. The most common tree is the myrsinaceous *Rapanea macrophylla*; but *Albizzia, Podocarpus,* and *Salix* are common. *Marattia fraxinea* was common on the damp forest floors, and also the little *Begonia bracteosa*. In dry places is *Cheilanthes farinosa*, the 2 m. high *Dryopteris Bergiana*, and the 1 m. high *Adiantum Poiretii*. Other plants in this region are listed. Gradually the gully woods pass over into the alpine forests. At an altitude of 2200 m. *Ficus chlamydocarpa*, 15 m. high, *Nuxia Ledermannii*, 8–10 m. high, and the liane *Gouania longispicata* are conspicuous. *Asplenium furcatum* is an epiphyte in this region.—*K. M. Wiegand.*

1506. Fleischer, M. **Die Moosvegetation im Urwald von Bialowies [Lithuania]. [The moss vegetation in the virgin forest of Bialowies.]** Bot. Jahrb. 55 (Beiheft): 113–124. 1919.—The forest is mainly undisturbed by man. Though the variations in altitude are slight, reaching an extreme of only 170 m., the conditions are very diverse, due to changes in the moisture and water level. Swampy forests on the lowlands give place on the sandy ridges to dry fir woods and Calluna heath, with alternating bogs and sphagnum moors between. The richest moss flora is in the damp upland mixed forest which is mainly composed of broad-leaved trees and firs. All the trees are more or less covered with epiphytic mosses and lichens, and the humus is generally covered deep with moss. There may be recognized a xerophytic bark moss formation requiring little food, and a more pretentious terrestrial formation, mainly mesophytic. A vivid account is given of the moss flora, bringing out the resemblances to the flora of central Europe and some of the differences. Many species are the same in both localities. The moss flora of the forest floor is richer than that in Germany. The bark formation and the ground formation are connected by the mosses living at the base of the trees as *Eurynchium strictum, Metzgeria furcata, Ptilidium ciliare,* etc. On the moors a few mosses are found among the carices, such as *Aulacomnium palustre* and *Calliergon stramineum,* mixed more or less with sphagnum. The relation of mosses to light is very interesting ecologically. Most prefer diffuse light to direct sunlight (skiophile), but this diffuse light may be too weak. Wiesner showed that below 1/70–1/90 the total shade begins, in which no moss can grow. The moss habit is a direct adaptation to the struggle for sufficient light. *Neckera pennata* shows this; so also does the intermittent story-like growth of the soil mosses, which are less dependent on the rainfall than on light. The rainfall theory is very poorly supported by the actual conditions. The story-like growth lets in light. Many mosses and liverworts in the tropics show this adaptation even better. Fan-shaped plagiotropic growth and sickle-shaped leaves are an adaptation against too strong light. Most shade mosses have a plagiotropic growth or horizontal branching. Curved capsules are probably not a response to light. *Anomodon* spp. seem to require the least light, and are found in the darkest woods, where their chlorophyll is still protected by the papillose cells. Even the protonema may be influenced by light, as in *Tetraphis pellucida*. Phototropic mosses are fewer, and are mostly wanting in the primitive forest. Many mosses are polyclinic, growing in light or shade, as *Polytrichum commune. Sphagnum* is light loving, but the chlorophyll is protected by a cell screen—a method found also in *Leucobryum,* and common in the tropics. The violet or brown colored walls in *Sphagnum* protect the plant against sunlight. The best examples of such protection are found among the tropical Neckeraceae and Hookeraceae, and among foliose liverworts. The struggle in the shade is for a light optimum; in the open it is against too much sunlight.—*K. M. Wiegand.*

1507. Laing, R. M. **The vegetation of Banks Peninsula [New Zealand], with a list of species [flowering plants and ferns].** Trans. and Proc. New Zealand Inst. **51**: 355–408. 1919.—A general introductory discussion of the physiography, plant distribution, and associations of the region, is followed by an annotated list of species.—*L. W. Riddle.*

1508. Ledermann, C. **Einiges von der Kaiserin-Augusta-Fluss-Expedition [New Guinea]. [Notes on the Empress Augusta River Expedition.]** Bot. Jahrb. 55 (Beiheft): 33–44. 1919.—The expedition landed in February, 1912, at Madang, and travelled up the Sepik river, establishing a permanent base-camp about five kilometers above the village of Malu. The surrounding region included mountain slopes, alluvial woods, swamps, sage-swamps, pandanus

formations, and great flatlands of grass and lakes. The second-growth forest near the camp contained introduced yams, taro, tobacco, brakes, species of Jambosa, Gnetum, etc. Side trips were made to the "Zuckerhut," Mt. "Berges," April river, Mt. Pyramid, and the "Hunstein Spitze" by way of the river Sepik and the "Swartz" river. The vegetation is vividly described for each trip. Proteaceae 20 m. high were seen, along with Ficus trees 25–30 m. high. Ferns, selaginellas, climbing freycinetias and rhaphidophoras, epiphytic orchids, dracaenas, and narrow leaved pandanuses were seen in the more humid forests. Landslides and wind-falls were often covered with Scitamineae and Araceae. In places the soil was saturated and covered with a thick layer of moss. On the steep rocky slopes of the "Felspitze" the substratum caused an elimination of tree species, but *Ficus* spp. were common, as also *Macaranga* spp. Red seedlings of the latter were very numerous and conspicuous. The ficus roots have great power of penetration among the rocks, or even of splitting them. On the declivities the abundant terminalias with their phototropic tops looked, when viewed from above like a giant stairway. Monimiaceae, Symplocaceae, and Theaceae were abundant. The forest was so open in some places that epiphytes grew from the base to the crown of the trees. Ledermann spent a few weeks in the Marian, West Caroline, East Caroline, and Palau Islands before returning to Europe.—*K. M. Wiegand.*

1509. Newman, L. F., and G. Walworth. **A preliminary note on the ecology of part of the South Lincolnshire [England] Coast.** Jour. Ecol. 7: 204–210. 1919.—A survey of some 17 miles of salt marsh near the mouth of the River Witham, together with the areas reclaimed by the construction of a sea-wall some 70 years ago, is included in the report. The following associations are recognized and lists of species for each are given. (1) Bank zone, reclaimed land in permanent pasture grasses; (2) Bank-base zone, a narrow strip dominated by *Agropyrum junceum* and *Spartina stricta;* (3) *Festuca rubra* zone, in which there are associated with the dominant species *Spergularia salina* and *Glaux maritima;* (4) Intermediate zone, in which *Obione portulacoides* mingles with the species of the preceding association; (5) Obione zone, with *Obione portulacoides* and *Suaeda maritima;* (6) Festuca-Salicornia zone, at about high tide level, dominated by the genera indicated; (7) Salicornia zone, occupying the mud flats and having both annual and perennial species of the genus; and (8) Algae-Zostera zone, a rather narrow strip a quarter of a mile below high tide. Analyses of the various soils are given, and some of the main problems of the area are indicated.—*Geo. D. Fuller.*

1510. Pritzel, E. **Die Grettstadter Wiesen [Germany]. [The meadows of Grettstadt.]** Bot. Jahrb. 55 (Beiheft): 83–112. *1 map.* 1919.—The extensive meadows about Grettstadt are famous both for the abundance of showy flowers and richness in species. The underlying rocks are various, but mostly calcareous. The peat is little more than 1 m. thick. "Hochmoors" are not found, owing to the lime which prevents the growth of sphagnum. *Primula farinosa, Gentiana verna,* and other northern plants are supposed to be relics of the glacial migration, but this is questioned. The former plant and *Cirsium bulbosum* are very characteristic of this region. A description of the vegetation, with lists of species, is given under the following headings: I. Vegetation of the meadows. 1. The true meadows. 2. The depressions; (a) border ditches, (b) pockets of rushes. 3. Meadow shrubbery. Comparison with meadows of northern Germany. II. Forest; all deciduous, the predominating trees being *Quercus pedunculata* and *Fraxinus excelsior.* The undergrowth is rich and interesting. III. Water vegetation, in the "Unken" brook and water holes. IV. Vegetation on dry sandy soil; found in a few limited localities near the meadows. The transition zone between this vegetation and that of the meadow is interesting. V. Plants of the gypsum hills; these are predominatingly lime-loving plants. A few true calciphiles are lacking, probably due to a deleterious effect of the dolomite or gypsum; on the other hand a few of the plants present such as *Adonis vernalis, Astragalus danicus* and *Stipa capillata* seem to prefer gypsum. The scrub forests on the hillsides are interesting in their undergrowth.—*K. M. Wiegand.*

1511. Ramaley, Francis. **Subalpine lake-shore vegetation in north-central Colorado.** Amer. Jour. Bot. 7: 57–74. *6 fig.* 1920.—The physiography, climate, and soil of a subalpine area in north-central Colorado are recorded; and the lake-shore vegetation of a large number

of lakes, some morainal and some rock-basin in type, is described and discussed. Lists of species are presented, with soil-moisture index of each; and the various associations, with their successional relations and seasonal aspects, are described. Definite circum-areas are often developed. The succession leads from aquatic plants (which are few) through a well-developed moor (chiefly *Carex*), a heath association (chiefly *Kalmia* and *Gaultheria*), and a meadow association (chiefly *Erigeron*, *Castilleja*, *Ligusticum*, *Pedicularis* and *Vaccinium*) to the climax association of Engelmann spruce forest.—*E. W. Sinnott.*

1512. Rand, R. F. **Wayfaring notes from Great Namaqualand [Southwest Africa].** Jour. Botany **58**: 53–55. 1920.—The author visited this region in October, 1919. A brief account of the vegetation is given. It is mainly xerophytic. Patches of desolate country are occupied by leafless Euphorbias, and species of Aloe are frequent. As most of the country is a stony, sandy desert, the vegetation is mainly confined to the river beds, where trees of considerable size, principally Acacias, may be found. *Gomphocarpus fruticosus*, an asclepiad, and a pestiferous weed in many parts of Africa, occurs here in profusion. The nature of the sand-rivers is described in some detail. The plants are the despair of collectors, as they are so difficult to press. They are, however, very beautiful when living and in flower.—*K. M. Wiegand.*

1513. Watson, W. **Habitats of Hypericum humifusum.** Jour. Botany **57**: 353–354. 1919.—The author questions H. S. Thompson's statement in Jour. Botany that this plant is calciphile. He is inclined to agree with other botanists that it is calciphobe. May not its occurrence in limy regions be due to its shallow-rooted habit, the superficial layer of soil being acid? In one corn field, however, the author found the plant associated with calciphiles in such a way as to make an explanation difficult.—*K. M. Wiegand.*

## FLORISTICS

1514. Bertsch, Karl. **Wärmepflanzen im oberen Donautal [Germany].** [**Warm temperature plants in the upper Danube Valley.**] Bot. Jahrb. **55** (Beiheft): 313–349. *6 fig.* 1919. In this study the more typically alpine plants were excluded, as well as those occurring sporadically. Rare plants in stone quarries and gravel beds have often come from a distance and should be excluded. As a rule no isolated plants are endemic. All introduced plants were excluded from the study as far as possible; this was difficult, as local introduction of native plants is common. Plants of general distribution were also excluded. There was left a small group of plants which over a circumscribed area inhabited all available places. These island-like areas were the only infallible assurance of truly indigenous conditions. About sixteen species were finally included. Warm temperature plants would not be expected in so cold a climate, but is to be explained by the insolation. Heath and sand plain plants of warm countries are here restricted to rocks which are warmed by the sun or in some cases by chemical action. Most warm temperature plants live near the tops of the cliffs, where they avoid the frosts of the lowlands. The true heat conditions are shown by the warm-climate types of fruit trees that can be grown there. On the south side the warm temperature plants extend nearly to the bottom of the valley. They cover about 1/2000 part of the Alb Mountain. The comparative altitude of these plants here and in South Bavaria is studied, the lower limit especially being of great interest. The individual stations for our plants in the southwest, central and northeast slopes of the Alb are in the ratio of 87: 9: 1, which is remarkable as the temperature is higher in the northeast. The hypothesis that the presence of the warm temperature plants on the Alb is due to a post-glacial steppe period, is not supported by the conditions on the southwest slope. These plants were there before the glacial period, and by a study of the snow line it is shown that the southwest slope was free from ice at that time, while the northeast slope probably was not. Warm temperature plants now live near the glacier and obviously could have so lived during the glacial period. It is interesting to note that alpine plants are frequently found in the valley, while the warm temperature plants are only on the edge.—*K. M. Wiegand.*

1515. Cambage, R. H. **Notes on the native flora of New South Wales. Part 10. The Federal Capital Territory.** Proc. Linnean Soc., New South Wales 43: 673–711. *Pl. 71–74.* 1918.—An area of about 900 square miles (latitude 35°–36° S.) is discussed. An account of early explorations, geographical (map), climatological, and geological characteristics is given. The absence of trees from the Camberra Plains is pointed out, and soil analyses are given in an attempt to explain this condition. Some peculiar insect attacks of trees were also noted. A general discussion of the flora is given. Certain plants found nearby, but absent from this district, largely as a result of climatic characteristics, are mentioned. A list of plants seen (pages 701–709 is given subject to revision. This includes: Leguminosae, 43 species; Compositae, 42; and Myrtaceae, 34. A total of 361 native species were found, 65 per cent of which are also indigenous to Tasmania.—*Eloise Gerry.*

1516. Cheeseman, T. F. **Contributions to a fuller knowledge of the flora of New Zealand: no. 6.** Trans. and Proc. New Zealand Inst. 51: 85–92. 1919.—An annotated list of vascular plants not previously recorded from or of rare occurrence in New Zealand.—*L. W. Riddle.*

1517. Eastwood, Alice. **Early spring at the Grand Cañon near El Tovar [Arizona].** Plant World 22: 65–99. *2 fig.* 1919.—A description of the spring flora of the Grand Cañon is given, with notes on the distribution and appearance of prominent species.—*Charles A. Shull.*

1518. Flynn, Mrs. Nellie. **A correction.** Rhodora 22: 16. 1920.—In the report of the trip of the Vermont Botanical Club (Rhodora 21: 191. 1919) *Littorella uniflora* was reported as having been collected at "The Gut," South Hero, Vermont. This was an error, the plant in question being *Myriophyllum tenellum,* which occurs occasionally in the state.—*James P. Poole.*

1519. Herriott, Miss E. M. **A history of Hagley Park, Christchurch, with special reference to its botany.** Trans. and Proc. New Zealand Inst. 41: 427–447. 1919.—A comparison of the flora in 1864 with that of the present time.—*L. W. Riddle.*

1520. Jackson, A. Bruce. **Bedfordshire [England] Plants.** Jour. Botany 58: 91. 1920. A record of *Carex divisa* var. *chaetophylla* Kükent. in Bedfordshire, England.—*K. M. Wiegand.*

1521. Johnston I. M. **The flora of the pine belt of the San Antonio Mountains of southern California.** Plant World 22: 71–90, 105–122. *2 fig.* 1919.—A description of the San Antonio Mountains and their life zones is given, with lists of plants characterizing each zone. The flora is presented as a catalogue by families, and contains the names of over 300 vascular plants, with notes on the occurrence and distribution.—*Charles A. Shull.*

1522. Long, Bayard. **Jasione montana a conspicuous weed near Lakewood, New Jersey.** Rhodora 21: 105–108. 1919.—The writer gives an account of the discovery of about a dozen distinct stations in the neighborhood of Lakewood, New Jersey, where this plant was found growing abundantly in 1917. This species is well known about Newport, Rhode Island, especially on Connecticut Island; but elsewhere it has previously been noted as a very unusual plant. In these newly established stations the characteristic habitats were open, sandy areas generally associated with settlement and cultivation. This plant has previously been known largely as a ballast-ground waif, but in these stations seemed to be a thoroughly established weed, and was reported by one farmer as having been frequent in the region for twenty-five years.—*James P. Poole.*

1523. Palmer, Ernest J. **Texas Pteridophyta. III.** Amer. Fern Jour. 9: 81–85. 1919. The author continues the enumeration of the Pteridophytes of Texas, listing 18 species distributed among 11 genera with habitat and localities.—*F. C. Anderson.*

1524. Riddelsdell, H. J. **Gloucestershire [England] Notes.** Jour. Botany **57**: 350–353. 1919.—The paper consists of critical notes on the distribution of about 30 species in Gloucestershire.—*K. M. Wiegand.*

1525. Thompson, H. S. **Euphrasia hirtella Jord.** Jour. Botany **58**: 25. 1920.—Further notes on the occurrence of this species in Britain. This is supplementary to the author's paper in Jour. Botany, Dec., 1919.—*K. M. Wiegand.*

1526. Wallis, Anthony, edited by C. E. Salmon. **Pembrokeshire and Carmarthenshire plants [Wales].** Jour. Botany **57**: 345–350. 1919.—An account is given of the life of Wallis. The paper consists mainly of notes on the distribution of a large number of species in various families. Those from the two counties are listed separately.—*K. M. Wiegand.*

1527. Weatherby, C. A. **An omission in the preliminary list of New England Ranunculaceae.** Rhodora **21**: 104. 1919.—In the list of New England Ranunculaceae (published in Rhodora **20**: 182. 1918) the one New England record for *Cimicifuga racemosa* (*L.*) *Nutt.*, *var. dissecta Gray* was omitted. The plant in question was collected by E. H. Eames at Stratford, Connecticut, in 1893.—*James P. Poole.*

1528. Winslow, E. J. **Willoughby Lake, Vt., a candidate for the title of "Richest fern locality."** Amer. Fern Jour. **9**: 107–109 1919.—The Willoughby list, containing 35 species, is compared with the lists of three other localities; 27 species are common to all four localities, and the combined lists contain only 40 species, which is only 6 less than the list for all New England and New York, north of Connecticut.—*F. C. Anderson.*

1529. Woodward, R. W. **Some Connecticut plants.** Rhodora **21**: 114–116. 1919.—The writer reports what appears to be *Philotria angustifolia* (*Muhl.*) *Britton* growing in brackish water near Old Lyme, Connecticut. He could find no printed record of its previous occurrence in brackish water. *Lophotocarpus spongiosus* is also reported as growing quite abundantly at one station in the same town. It was previously reported as of rare occurrence there. Other plants which the author reports as having collected in various parts of the state are *Panicum virgatum cubense, Elymus riparius, Carex glaucodea, Eriocaulon Parkeri, Actaea rubra neglecta, Aquilegia canadensis flaviflora,* and *Epilobium molle.—James P. Poole.*

## FOREST BOTANY AND FORESTRY

Raphael Zon, *Editor*

J. V. Hofmann, *Assistant Editor*

1530. Anonymous. **Brazil wood.** Kew Bull. Misc. Inf. [London] **1920**: 79–80. 1920 — Notes on *Haematoxylon brasiletto,* the wood of which was formerly an important article of commerce. Notes are given also on *Caesalpinia bahamensis,* the wood of which furnishes a similar dyestuff.—*E. Mead Wilcox.*

1531. Anonymous. **Helgelands Skogselskab. [Report from the Forestry Association at Helgeland, Norway.]** Tidsskr. Skogbruk **28**: 129–130. 1920.—The writer relates the interesting fact that Norway spruce, which had been planted out on the wind-swept dunes near the sea, had developed laterally only during the first years, as if to gain protection to the roots. After some years the trees at once began to assume their usual height growth.—*J. A. Larsen.*

1532. Anonymous. **The new flagstaff at Kew.** Kew Bull. Misc. Inf. [London] **1919**: 393–399. *Pl. 12–13.* 1919.—The new flagstaff is 214 feet high and made from a 400-year-old tree of *Pseudotsuga douglasii* from Canada.—*E. Mead Wilcox.*

1533. Anonymous. **[Reports from the forest associations in different parts of the country [Norway].** Tidsskr. Skogbruk **28**: 126–132. 1920.

1534. Anonymous. **Timber depletion and the answer. A summary of the report on timber depletion and related subjects prepared in response to senate resolution 311.** U. S. Dept. Agric. Dept. Circ. 112. *16 p.* 1920.—Discussion of forest resources of the United States, yesterday and today, and suggestions for a national forest policy which is needed to meet the timber depletion situation.—*L. R. Hesler.*

1535. Bartlett, H. H. **The manufacture of sugar from Arenga saccharifera in Asahan, on the east coast of Sumatra.** Michigan Acad. Sci. Ann. Rept. 21: 155–165. *Pl. 3–6.* 1919.—See Bot. Absts. 6, Entry 1892.

1536. Betts, H. S. **How lumber is graded.** U. S. Dept. Agric. Dept. Circ. 64. *39 p., 9 fig.* 1920.—A discussion and explanation of hardwood and softwood lumber grading, accompanied by descriptions of typical rules.—*L. R. Hesler.*

1537. Carlson, K. A. **The growing of mine props on the High Veld.** Jour. Dept. Agric. Union of South Africa 1: 261–270. 1920.—A low grade quality of timber can be used for mine props, and advantage is taken of this circumstance to plant the most rapidly growing species which supply a timber of sufficient strength. To meet these requirements the principal species used are *Eucalyptus viminalis, E. rostrata, E. Maidenii, E. globulus* and *E. sideroxylon;* sylvicultural notes are given on each of these species. The cost of planting and maintenance is discussed, and it is stated that there are undoubtedly good prospects for afforestation conducted on sound lines.—*E. M. Doidge.*

1538. Clinton, G. P., and Florence A. McCormick. **Infection experiments of Pinus strobus with Cronartium ribicola.** Connecticut (New Haven) Agric. Exp. Sta. Bull. 214: 428–459. *Pl. 37–43.* 1916–1918.—See Bot. Absts. 6, Entry 225.

1539. Crevost, C., and C. Lemarié. **Plantes et produits filamenteux et textiles de l'Indochine.** [**Fiber- and textile-producing plants of Indo-China.**] Bull. Econ. Indochine 22: 675–709. *19 pl.* 1919. Ibid. 23: 45–71. *4 pl.* 1920.—This is another contribution to this series covering in detail chiefly the bast-fiber producing plants of the Leguminosae, Malvaceae, Tiliaceae, Sterculiaceae, and Linaceae, as well as those fibers especially adapted for the manufacture of cordage, and for the manufacture of paper.—*E. D. Merrill.*

1540. Dixon, Henry H. **Mahogany and the recognition of some of the different kinds by their microscopic characters.** Sci. Proc. Roy. Dublin Soc. 15: 431–486. *22 pl.* 1918.—See Bot. Absts. 6, Entry 385.

1541. Doyle, Joseph. **Observations on the morphology of Larix leptolepsis.** Sci. Proc. Roy. Dublin Soc. 15: 310–327. *2 pl.* 1918.—See Bot. Absts. 6, Entry 386.

1542. Harvey, LeRoy H. **Some phytogeographical observations in Lake County, Michigan.** Michigan Acad. Sci. Ann. Rept. 21: 213–217. 1919.

1543. Haslund, Ove. **Skogvärdierne.** [**Forest valuation and taxation.**] Tidsskr. Skogbruk 28: 120–123. 1920.

1544. Henry, Augustine, and Margaret G. Flood. **The Douglas firs: a botanical and silvicultural study of the various species of Pseudotsuga.** Proc. Roy. Irish Acad. **B, 35:** 67–90. *Pl. 12–14.* 1920.—The genus *Pseudotsuga* is divided into seven species and one variety as follows: (1) *P. douglasii* (Carriere) (*taxifolia* Britton), Pacific coast of North Amer.; *P. douglasii* var. *caesia* (Schwerin), northern Rocky Mts.; (2) *P. glauca* (Mayr), Rocky Mts., Colorado and Mexico; (3) *P. macrocarpa* (Mayr), southern California; (4) *P. japonica* (Beissner), Japan; (5) *P. sinensis* (Dode), N. E. Yunnan, China; (6) *P. forrestii* (Craib.), W. Yunnan, China; (7) *P. wilsoniana* (Hayata), Formosa.—Botanical characteristics, range, and size of each species are given, followed by detailed discussion of silvical and botanical differences between the Oregon and Colorado species. Measurements of the two species in

British plantations show that while the former "when grown in dense plantations surpasses all other species in yield of timber," the latter "is healthy enough but it is of no commercial value for planting."—Differences in microscopical leaf structure in the various species are indicated with the aid of typical cross section drawings. As final proof of the specific rank of *Pseudotsuga glauca*, results of distillation experiments with leaves of this tree and of *P. taxifolia* from British plantations are given. Oil from the Oregon species contains appreciable amounts of the fragrant *geraniol*, chief constituent of Indian palmarosa oil and present in citronella oil, otto of roses, lemon oil, etc., hitherto reported as a constituent of the oil of some species of *Callitris*, or "Cypress Pines" of Australia, but not from other conifers. This oil, which is said to give the peculiarly pleasant odor to the leaves of Oregon Douglas fir, is not found in the Colorado variety. Oil of the latter species contains a large percentage of *pinene*, which constituent is not found in the Oregon species. An interesting analogy is pointed out in the distribution, size of cones, and difference in oil content of the varieties of Douglas fir and Western Yellow Pine.—*Woodbridge Metcalf.*

1545. Judd, C. S. **The Australian red cedar.** Hawaiian Forester and Agric. **17**: 57–59. *1 pl.* 1920.—An account of the successful introduction of *Cedrela Australis* in Hawaii, with a general description of its appearance, silvical characters, and economic uses. Because of its ease of propagation, rapid growth, and valuable wood products, it gives great promise as one of the future timber-producing trees of the territory. The plate shows an Australian red cedar, measuring 30 feet in height, 4¼ inches d.b.h., two years and nine months from planting.—*Stanley Coulter.*

1546. Judd, C. S. **Division of Forestry.** Hawaiian Forester and Agric. **16**: 6–9. 1919.—In addition to the routine report for December, 1918, the establishment and location of six new forest reserves, aggregating 41.355 acres is given. This gives a present total area of forest reserves in the Territory of 814,926 acres, of which 554.842 acres is government land.—*Stanley Coulter.*

1547. Judd, C. S. **Eucalyptus plantation.** Hawaiian Forester and Agric. **16**: 20–24. 1919.—"The object of the plantation was to secure data as to the habit, form, rate of growth, and relative value under local conditions of species of Eucalyptus supposed to be of economic importance that are as yet but little known in Hawaii." The conditions were not favorable for best growth and development and the test was an endurance rather than a growth test. Eighteen species were planted, measurements being made at five years growth, both of diameter and height. Of the species used, the Black butt (*E. pilularis*) made the best showing, producing an equivalent of 4½ cords per acre in five years. Other species making a fair showing were *E. gomphocephala*, *E. muelleriana*, and *E. Sieberiana*, which produced an equivalent yield of 3.42 to 3.62 cords per acre for five years. Measurements are to be continued at five year intervals.—*Stanley Coulter.*

1548. Judd, C. S. **Forestry in Hawaii.** Hawaiian Forester and Agric. **16**: 271–299. 1919.—A series of 3 lectures delivered at the short course for plantation men at the College of Hawaii, Honolulu. The subjects treated are "The Beneficial Effects of Forests," "The Native Hawaiian Forests," and "Methods of Forest Protection." Admirably adapted to Hawaiian needs.—*Stanley Coulter.*

1549. Judd, C. S. **The koa tree.** Hawaiian Forester and Agric. **17**: 30–35. *Pl. 3.* 1920.—The genus *Acacia*, to which the Koa belongs, is represented in the Hawaiian Islands by three species, one of which, *A. Koa*, has two varieties. *Acacia Koa* is the familiar form and is found on all of the islands. The other species and varieties are less common and of more or less restricted distribution. General descriptions of the forms are given and the possible origin and economic uses are discussed. At one time the Hawaiians used Koa wood for canoes, surf boards, paddles, and spears, as well as for house timber. Very few Koa canoes are now made since the large trees suitable for their construction have almost entirely disappeared. The chief present value of the Koa tree is not as a lumber producer, but as a tree for a cover forest on mountain slopes. It is also a suitable tree for reforesting denuded areas where good drainage and favorable soil conditions obtain.—*Stanley Coulter.*

1550. JUDD, C. S. **The kukui or candlenut tree.** Hawaiian Forester and Agric. 16: 222–223. *Pl. 1.* 1919.—This Euphorbiaceous tree (Aleurites moluccana (L) Willd.) was probably introduced into Hawaii by the natives many years ago from Kahiki. They depended for their illumination upon its oily nuts, and from the juice of the fleshy covering of the green fruit secured the black dye with which they tatooed their skins. The Kukui is the distinguishing tree in the forest type which is found from approximately 1000 to 2000 feet above sea level. The tree is singularly free from serious insect pests and plant diseases although the white, light, soft wood rots very readily and is not at all durable in contact with the soil.—*Stanley Coulter.*

1551. JUDD, C. S. **Lands in forest reserves, Territory of Hawaii, April 1, 1919.** Hawaiian Forester and Agric. 16: 89–100. 1919.—The significance of forestry in the Territory of Hawaii can be best appreciated by a summary of the acreage of lands in forest reserves in the different islands. Kauai has 148,213 acres; Oahu, 67,933; Molokaie, 44,674; Mani, 121,128; and Hawaii, 436,791—a total of 818,739 acres.—*Stanley Coulter.*

1552. JUDD, C. S. **The Makiki nursery.** Hawaiian Forester and Agric. 17: 124–126. 1920.—An interesting and compact sketch is given of the plan and output of this nursery located in Makiki Valley, Honolulu. The annual average distribution of tree seedlings for the past seven years has exceeded 350,000. Attention is also given to ornamental shrubs and vines.—*Stanley Coulter.*

1553. JUDD, C. S. **Original algaroba tree gone.** Hawaiian Forester and Agric. 16: 308–310. *2 pl.* 1919.—Notes the destruction, due to city improvement, on October 23, 1919, of the algaroba tree planted by Father Bachelot in December, 1828, in the Catholic mission grounds. "Perhaps no other tree in the world has had such a remarkable history or has been responsible for greater benefits than this original algaroba, from which there have been established on the shores throughout these islands forests which cover approximately 90,000 acres, now producing an annual crop of about 30,000 cores of excellent fuel, over $100,000 worth of honey, and an enormous yield of beans which furnish a valuable fattening food for stock at a time when the long, dry summer has exhausted the grass supply.—*Stanley Coulter.*

1554. JUDD, C. S. **A volume table for algaroba.** Hawaiian Forester and Agric. 16: 64–66. 1919.—The algaroba (*Prosopis juliflora* D. C.) introduced into Hawaii in 1828 has since spread over approximately 80,000 acres of what was formerly waste or poor grazing land. The wood is used largely for fuel and has therefore a high economic value. The table, which is to be regarded as merely preliminary, is based on the measurement of 19 trees in the Punahou district. Whether it will apply to the scattered algaroba tracts on the Island is yet to be determined.—*Stanley Coulter.*

1555. JUDD, C. S. **The wiliwili tree.** Hawaiian Forester and Agric. 17: 95–97. *2 pl.* 1920.—The wiliwili belongs to the genus *Erythrina* and is represented in the Hawaiian Islands by the single species *E. monosperma.* It occurs in clumps or as individuals up to 1500 feet elevation in the hottest and driest districts on the leeside of all of the islands. The tree is probably best known because of its wood, which is the lightest of any of the Island trees. It is also characterized by its wealth of crimson blossoms, which make it worthy of cultivation as an ornamental.—*Stanley Coulter.*

1556. KAURIN, W. **Skogplantningen i Frankrike.** [Forest planting in France.] Tidskr. Skogbruk 28: 97–108. *9 pl.* 1920.—Plantings made in the French war zone by the Norwegian government.—*J. A. Larsen.*

1557. KORSTIAN, CLARENCE F. **Native vegetation as a criterion of site.** Plant World 22: 253–261. 1919.—The author presents a general discussion of methods of site determination, and suggests that no one criterion should be adopted to the exclusion of other criteria. He urges that more consideration should be given to the indicator significance of native shrubby and herbaceous vegetation in classifying forest lands, and in selecting suitable sites for reforestation work.—*Charles A. Shull.*

1558. Kotze, J. J. **Wood-charcoal and its manufacture.** South African Jour. Indust. 3: 423–437. 1920.

1559. Lovejoy, P. S. **Farms vs. forests.** Michigan Acad. Sci. Ann. Rept. 21: 201–212. 1919.—The writer gives in a general way the condition of the 228,509,000 acres of logged-off land in the United States to-day. It has been the custom, especially in Michigan and other lake states, to attempt to replace all cut-over forest lands with farms. The unscrupulousness of the professional colonizer and the inability of the home seeker to foresee conditions has caused 4,000,000 acres of land, or 100,000 farms, to be abandoned. The writer suggests that an analysis be made of each cut-over region in order to determine whether the area should be used for general farming, grazing, fruit growing, or reforesting. The real farm and the real forest need not overlap. The writer further emphasizes the general forest conditions of to-day and the urgent need for the reforesting of the logged-off, idle lands.—*H. C. Young.*

1560. Rock, Joseph F. **One government forest.** Hawaiian Forester and Agric. 16: 39–40. *Pl. 3.* 1919.

1561. Werner, J. **Stipendieberetning.** [**Report from a travelling fellowship.**] Tidsskr. Skogbruk 28: 108–117. 1920.—Observations on plantations and forest conditions near Bergen and Stavanger on the west coast of Norway.—*J. A. Larsen.*

1562. Young, L. J. **A study in the difference in soil requirements of pine and spruce.** Michigan Acad. Sci. Ann Rept. 21: 219–221. 1919.—This article points out the importance in forest plantings of a proper consideration of site condition and species to be planted. In the Saginaw Forest there is an area where spruce has been making a poor growth for 15 years. The surface soil has been badly washed and is also very poor in the necessary elements. This is taken as the reason for the unusually poor tree growth. Pine is said to demand less from a soil in order to make the same growth; so pine was planted some 4 years ago among the spruce. Since pine trees grow relatively slowly during the first 5 years, there has not been sufficient time in this experiment to show how well they can do; but the Scotch pine averages a foot taller in 4 years than the spruce in 15 years. The Scotch pine is more adaptable, therefore, for this site and should have been planted originally. Other species of pine were planted also. More complete results will be forthcoming in 4 or 5 years; more definite conclusions can be drawn from these.—*R. P. Hibbard.*

## GENETICS

G. H. Shull, *Editor*
J. P. Kelly, *Assistant Editor*

1563. Abidin, J. **Pferdezucht und Pferderassen im osmanischen Reich.** [**Horse breeding and the breeds of horses in the Turkish Empire.**] Flugschr. Deutsch. Ges. f. Züchtungskunde 42: 1–31. *47 fig.* 1918.—This paper goes briefly into the history of military horse breeding in Turkey and describes the breeds of horses found in the Old Turkish Empire. The sub-breeds of the Arab horse, the customs connected with horse breeding, and the beliefs held by the Arabs in regard to heredity are discussed in most detail.—*Sewall Wright.*

1564. Adamson, R. W. **The Bartram oak.** Sci. Amer. 122: 301. 1920.—Confirmatory comment on Arthur Hollick's article, "The story of the Bartram Oak," Sci. Amer. 121: 422. 1919. "From time immemorial" common comment in the South, where these heterophyllous oaks are abundant, is that they are willow oak × red oak hybrids. Natural progeny of southern heterophyllous oak shows large numbers of classes based on leaf form. [See Bot. Absts. 4, Entry 615.]—*J. Ben Hill.*

1565. Åkerman, Å. **Speltlike bud-sports in common wheat.** Hereditas 1: 116–127. *6 fig.* 1920.—Two spikes were chimaeras, conditioned by a speltoid heterozygote and its corresponding normal type, of which the latter formed the greater part of the spikes, while the

speltoid only formed the epidermis of one side of the spikes. Consequently all the seeds gave typical plants only. In a third chimaera-spike the speltoid component seems to have given rise only to part of the epidermis in the lower part of the spike, while in the development of the upper part the typical epidermis has been entirely replaced by the speltoid. A fourth spike had the outer glumes on the four lowest spikelets on each side of the rachis quite typical and distended on the one side of the spikelets, while on the other side they were speltoid. In the upper part of the spike all the outer glumes were of the speltoid type. From the seeds situated nearest the typical outer glumes in the 8 lowest spikelets 5 typical plants were obtained in all. The others gave speltoids and the normal type. The progeny of the normals were all normals. The plants originating from the speltoids showed segregation into speltoid heterozygotes identical with the parent plants, and plants of the normal type in the ratio 1:1 (Cf. Nilsson-Ehle, Bot. Not. 1917). The plant in question may be a real chimaera largely made up of a speltoid heterozygote together with two sectors of the normal type of at least two cell layers in thickness.—*K. V. Ossian Dahlgren.*

1566. Amend, F. **Untersuchungen über flämischen Roggen unter besonderer Berücksichtung des veredelten flämischen Landsroggen und seiner Züchtung. [Investigations on Flemish rye with special reference to improved varieties and their breeding.]** Landw. Jahrbüch. 52:-614-669. 1919.—Original Flemish "land-rye" (Landroggen) subjected to breeding since 1903 in maritime climate of western Flanders. From 1903 to 1909 mass selection of heads was practised, but beginning in 1909 plant selection. Work interrupted by war. The fine qualities of the "land-rye" resulted. Certain correlations are pointed out. Uniform head of medium thickness and green grains are given by author as desirable qualities to breed for. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 112. Dec. 1919.]—*J. P. Kelly.*

1567. Anonymous. **Ten week stock and doubling.** Florists Exch. 50: 159. July 24, 1920.—There is little foundation for the assumption that Germans have a secret enabling them to produce strains of stocks yielding 80 per cent or over of doubles. Because of scarcity of seed due to the war, English and French growers started raising their own seed. French had already proved they could produce strains yielding a high percentage of doubles. Experiments carried on by staff of Royal Horticultural Society showed that higher percentage of doubles was produced by more vigorous plants, but this met disapproval. In Scotland the strain Midlothian yielded more doubles with age. However, it was found that a strain bred for doubleness will through its singles continue to produce doubles in the same proportion. French pot-saved seed and English open-ground seed were planted in the open, the French strain producing a much higher percentage and superior quality of doubles. Single-flowered plants of the white-flowered double-growing French strain varied but slightly as to flower characters, but markedly in seed-pod characters. Some plants had long, thin, easy-thrashing pods, others short, thick, hard-thrashing pods. Thin pods are believed to give rise to mostly singles; thick ones to mostly doubles. Five hundred progeny from an extra long, thin-podded plant gave only 2 doubles, while progeny from short-podded plants gave as high proportion of doubles as best pot-saved seeds.—*Francena R. Meyer.*

1568. Anonymous. **Biometric and eugenic laboratories at University College, London.** Science 52: 30–31. July 9, 1920.—At this institution there has been added to the Drapers' Company Biometric Laboratory and the Galton Laboratory for National Eugenics, a third building provided by Sir Herbert Bartlett. This last is superbly equipped with museums, lecture theater, laboratory rooms, and apparatus.—*Merle C. Coulter.*

1569. Anonymous. [Rev. of Anthony, Stephen, and Harry V. Harlan. **Germination of barley pollen.** Jour. Agric. Res. 18: 525–536. *2 pl., 2 fig.* Feb. 16, 1920.—[See Bot. Absts. 5, Entries 949 and 1449.] Gard. Chron. 68: 103. Aug. 28, 1920.

1570. Anonymous. [German rev. of Backhouse, W. O. **The inheritance of glume length in Triticum polonicum. A case of zygotic inhibition.** Jour. Genetics 7: 125–133. Feb., 1918. (See Bot. Absts. 1, Entry 211; 3, Entry 2157.)] Zeitschr. Pflanzenzücht. 7: 206. June, 1920.

1571. Anonymous. [German rev. of: Bartlett, H. H. **The status of the mutation theory with especial reference to Oenothera.** Amer. Nat. **1916**: 513–529. 1916.] Zeitschr. f. Pflanzenzücht. **7**: 207–209. June, 1920.

1572. Anonymous. [German rev. of Becker. **Serologische Untersuchungen auf dem Gebiete von Pflanzenbau und Pflanzenzucht.** (Serological investigations in the realms of horticulture and plant breeding.) Landwirtsch. Jahrb. **53**: 245–276. 1919.] Zeitschr. Pflanzenzücht. **7**: 209. June, 1920.

1573. Anonymous. [German rev. of: Beijerinck, M. W. **De enzymtheorie der erfelijkheid.** (The enzyme theory of heredity.) Kon. Akad. Wetensch. Amsterdam **25**: 1231. 1917. See Bot. Absts. 1, Entry 1166. 3, Entry 433.)] Zeitschr. Pflanzenzücht. **6**: 186. Dec., 1918.

1574. Anonymous. [German rev. of: Brotherton, Wilber, Jr., and H. H. Bartlett. **Cell measurement as an aid in the analysis of quantitative variation.** Amer. Jour. Bot. **5**: 192–206. *2 fig.* April, 1918. (See Bot. Absts. 1, Entry 865.)] Zeitschr. Pflanzenzücht. **7**: 209. June, 1920.

1575. Anonymous. [German rev. of: Cohen-Stuart, C. P. **A basis for tea selection.** Bull. Jarb. Bot. Buitenzorg. **III**, **1**: 193–320. 1919. (See Bot. Absts. 5, Entry 1469.)] Zeitschr. Pflanzenzücht. **7**: 209. June, 1920.

1576. Anonymous. [German rev. of: Correns, C. **Fortsetzung der Versuche zur experimentellen Verschiebung des Geschlechtsverhältnisse.** (Continuation of the attempt to experimentally shift the sex ratio.) Sitz.-Ber. Preuss. Akad. Wiss. Berlin **1918**: 1175–1200. *3 fig.* 1918.] (See Bot. Absts. 5, Entry 1636.) Zeitschr. Pflanzenzücht. **7**: 209. June, 1920.

1577. Anonymous. [German rev. of: Correns, C. **Zur Kenntnis einfacher mendelnder Bastarde. I. Die Unterscheidung der pilulifera-Homozygoten und der Heterozygoten des Bastardes Urtica pilulifera Dodartii. II. Mirabilis jalapa xantha und ihre Bastarde. III. Urtica urens peraurea.** (Contributions to knowledge of simple Mendelian hybrids. I. The distinguishing of pilulifera-homozygotes and the heterozygotes of the hybrid Urtica pilulifera Dodartii. II. Mirabilis jalapa peraurea.) Sitzungsber. k. Preuss Akad. Wiss. **1918**: 221–268. 1918. (See Bot. Absts. 1, Entry 1184.)] Zeitschr. Pflanzenzücht. **6**: 186. Dec., 1918.

1578. Anonymous. [German rev. of: Correns, C. **Vererbungsversuche mit buntblättrigen Sippen. I. Capsella bursa-pastoris albovariabilis und chlorina.** (Genetical studies with variegated races. I. Capsella bursa-pastoris albovariabilis and chlorina.) Sitzungsber. K. Akad. Wiss. Wien **34**: 585–610. 1919. (See Bot. Absts. 4, Entry 551.)] Zeitschr. Pflanzenzücht. **7**: 210. June, 1920.

1579. Anonymous. [German rev. of: Drude, C. **Erfahrungen bei Kreuzungsversuchen mit Cucurbita Pepo.** (Experiences in crossing experiments with Cucurbita Pepo.) Ber. Deutsch. Bot. Ges. **35**: 25–57. *1 pl.* 1918.] Zeitschr. Pflanzenzücht. **6**:–187–188. Dec., 1918.

1580. Anonymous. [German rev. of: Edler, W. **Die Verzweigung der Ackerbohne.** (Branching of field beans.) Fühlings Landwirtsch. Zeit. **1919**: 441 450. 1919.] Zeitschr. Pflanzenzücht. **7**: 210. June, 1920.

1581. Anonymous. [German rev. of: Emerson, R. A. **Genetical studies of variegated pericarp in maize.** Genetics **2**: 1–35. 1917.] Zeitschr. Pflanzenzücht. **7**: 210–212. June, 1920.

1582. Anonymous. [German rev. of: Everest, A. **Recent chemical investigations of the anthocyan pigments and their bearing upon the production of these pigments in plants.** Jour. Genetics **4**: 361–367. 1915.] Zeitschr. Pflanzenzücht. **6**: 188–189. Dec., 1918.

1583. Anonymous. [German rev. of: Fruwirth, C. Selection in pure lines. Jour. Heredity 8: 90–94. *1 fig.* 1907.] Zeitschr. Pflanzenzücht. 6: 189. Dec., 1918.

1584. Anonymous. [German rev. of: Fruwirth, C. Die Saatenanerkennung. (Seed recognition.) *131 p., 66 fig.* Paul Parey: Berlin, 1918.] Zeitschr. Pflanzenzücht. 6: 198. Dec., 1918.

1585. Anonymous. [German rev. of: Fruwirth, C. Handbuch der landwirtschaftlichen Pflanzenzüchtungen. II. Die Züchtung von Mais, Futterrüben und anderen Rüben, Oelpflanzen und Gräsern. (Handbook of agricultural plant breeding. II. The breeding of maize, fodder beets and other roots, oil plants and grasses.) *3rd ed., 262 p., 50 fig.* P. Parey: Berlin, 1918.] Zeitschr. Pflanzenzücht. 6: 198–199. Dec., 1918.

1586. Anonymous. [German rev. of: Fruwirth, C. Handbuch der landwirtschaftlichen Pflanzenzüchtung. 3. Die Züchtung von Kartoffel, Erdbirne, Lein, Hanf, Tabak, Hopfen, Buchweizen, Hülsenfrüchtern und kleeartigen Futterpflanzen. (Handbook of agricultural plant breeding. 3. The breeding of potatoes, Jerusalem artichokes, flax, hemp, tobacco, hops, buckwheat, legumes and clover-like forage plants.) *3rd ed., 240 p., 35 fig.* P. Parey: Berlin, 1919.] Zeitschr. Pflanzenzücht. 7: 222–223. June, 1920.

1587. Anonymous. [German rev. of: Hansen, W. Gedanken über Organisation und Arbeitsersparnis in der Pflanzenzucht. (Thoughts on organization and labor-saving in plant breeding.) Deutsch. Landw. Presse 1918: 261–262. 1918.] Zeitschr. Pflanzenzücht. 6: 189. Dec., 1918.

1588. Anonymous. [German rev. of: Harris, L. The application of correlation formulae to the problem of varietal differences in disease resistance: data from the Vermont experiments with potatoes. Amer. Nat. 51: 238–244. 1917.] Zeitschr. Pflanzenzücht. 6: 189. Dec., 1918.

1589. Anonymous. [German rev. of: Hromádko, J. Die Variabilität der Nachkommenschaft derselben Futterrübenmutter in der 1. Generation. (The variability of progenies of the same mother beet in the first generation.) Zeitschr. Zuckerindus. Böhmen 42: 581–601. 1918.] Zeitschr. Pflanzenzücht. 6: 189–190. Dec., 1918.

1590. Anonymous. [German rev. of: Johannsen, W. Ärftlicheten i historisk och experimentell belysning. (Heredity in historical and experimental light.) *viii + 327 p., 52 fig.* 1918.] Zeitschr. Pflanzenzücht. 6: 199. Dec., 1918.

1591. Anonymous. [German rev. of: Kalt, B. Der Begriff "Originalsaatgut" und seine Anwendung bei der Züchtungsanerkennung. (The concept "Original seed" and its application in the recognition of breeding.) Fühlings Landwirtsch. Zeit. 1919: 460–471. 1919.] Zeitschr. Pflanzenzücht. 7: 213. June, 1920.

1592. Anonymous. [German rev. of: Kiessling, L. Über eine Mutation in einer reinen Linie von Hordeum distichum L. (On a mutation in a pure line of Hordeum distichum L.) Zeitschr. indukt. Abstamm. Vererb. 19: 145–159. June, 1918.] Zeitschr. Pflanzenzücht. 6: 190. Dec., 1918.

1593. Anonymous. [German rev. of: Kiessling, L. Einige besondere Fälle von chlorophylldefekten Gersten. (Several special cases of barley, defective in chlorophyll.) Zeitschr. indukt. Abstamm. Vererb. 19: 160–176. June, 1918. (See Bot. Absts. 3, Entry 263.)] Zeitschr. Pflanzenzücht. 6: 190. Dec., 1920.

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1597. Anonymous. [German rev. of: Love, H. H., and W. T. Craig. **Fertile wheat-rye hybrids.** Jour. Heredity 10: 195–207. *11 fig.* May, 1919.] Zeitschr. Pflanzenzücht. 7: 216. June, 1920.

1598. Anonymous. [German rev. of: Love, H. H., and A. C. Fraser. **The inheritance of the weak awn in certain Avena crosses.** Amer. Nat. 51: 481–493. *2 fig.* 1917. (See Bot. Absts. 1, Entry 1263.)] Zeitschr. Pflanzenzücht. 6: 191. Dec., 1918.

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1609. Anonymous. [German rev. of: Roberts, Herbert F. **Yellow-berry in hard winter wheat.** Jour. Agric. Res. 18: 155–169. *2 fig.* Nov. 1, 1919.] Zeitschr. Pflanzenzücht. 7: 218–219. June, 1920.

1610. Anonymous. [German rev. of: Schellenberg, H. **Die Vererbungsverhältnisse von Rassen mit gestreiften Blüten und Früchten.** (The inheritance ratios of races with striped flowers and fruits.) Vierteljahrschr. Naturwissensch. Ges. Zürich 61: 1916.] Zeitschr. Pflanzenzücht. 6: 195. Dec., 1918.

1611. Anonymous. [German rev. of: Tornau. **Einige Mitteilungen über variabilitätsverhältnisse in einem konstanten Weizenstamm.** (Some communications concerning variability relations in a constant wheat strain.) Jour. Landw. 67: 111–149. 1919.] Zeitschr. Pflanzenzücht. 7: 219. June, 1920. [See Bot. Absts. 5, Entry 1677.]

1612. Anonymous. [German rev. of: Urban, J. **Über die Grösse der Stecklinge.** (On the size of cuttings.) Zeitschr. Zuckerindust. Böhmen 42: 521–526. 1918.] Zeitschr. Pflanzenzücht. 6: 195–196. Dec., 1918.

1613. Anonymous. [German rev. of: van der Wolk, P. **Onderzoekingen betreffende den Cocospalm.** (Investigations concerning the cocoanut palm.) Cultura 1918: 1–34. 1918.] Zeitschr. Pflanzenzücht. 6: 196. Dec., 1918.

1614. Anonymous. [German rev. of: von Rümker, K. **Die Züchtung der Ölpflanzen.** (The breeding of oil plants.) Jahrb. Deutsch. Landw. Ges. 33: 150–158. 1918.] Zeitschr. Pflanzenzücht. 6: 194. Dec., 1918.

1615. Anonymous. [German rev. of: von Rümker, K. **Die staatliche Organisation der Sortenprüfung.** (State organization of variety testing.) *32 p.* Paul Parey: Berlin, 1918.] Zeitschr. Pflanzenzücht. 6: 200. Dec., 1918.

1616. Anonymous. [German rev. of: von Rümker, K. **42 Sortenanbauversuche im Verwaltungsgebiete des Oberfehlshabers Ost.** (Forty-two variety culture tests in Oberfehlshabers Ost.) *72 p.* Paul Parey: Berlin, 1918.] Zeitschr. Pflanzenzücht. 6: 201–203. Dec., 1918.

1617. Anonymous. [German rev. of: von Ubisch, G. **Kritische Beträchtungen zur Hypothese der primären und sekundären Koppelung.** (Critical consideration of the hypothesis of primary and secondary coupling.) Zeitschr. indukt. Abstamm. Vererb. 19: 193–201. *3 fig.* June, 1918. (See Bot. Absts. 3, Entry 298.)] Zeitschr. Pflanzenzücht. 6: 195. Dec., 1918.

1618. Anonymous. [German rev. of: Wagner, M. **Abbauerscheinungen am Hopfen und Organisation in der Hopfenzüchtung.** (Phenomena in unimproved hops and organization in hop-breeding.) Deutsch. Landw. Presse 1919: 788. 1919.] Zeitschr. Pflanzenzücht. 7: 220. June, 1920.

1619. Anonymous. [German rev. of: Wheldale, M. **Our present knowledge of the chemistry of the Mendelian factors influencing flower colour.** Jour. Genetics 2: 369–376. 1915.] Zeitschr. Pflanzenzücht. 6: 196. Dec., 1918.

1620. Anonymous. [German rev. of: White, O. E. **Inheritance of endosperm color in maize.** Amer. Jour. Bot. 4: 396–406. 1917. (See Bot. Absts. 1, Entry 1313.)] Zeitschr. Pflanzenzücht. 7: 220. June, 1920.

1621. Anonymous. [German rev. of: White, O. E. **Breeding new castor beans.** Jour. Heredity 9: 195–200. May–June, 1918. (See Bot. Absts. 1, Entry 249.)] Zeitschr. Pflanzenzücht. 7: 220. June, 1920.

1622. Anonymous. [German rev. of: White, Orland E. **Inheritance studies in Pisum. III. The inheritance of height in peas.** Mem. Torrey Bot. Club. 17: 316–322. June 10, 1918. (See Bot. Absts. 1, Entry 250.)] Zeitschr. Pflanzenzücht. 7: 220. June, 1920.

1623. Anonymous. [German rev. of: White, O. E. **Inheritance studies on castor beans.** Brooklyn Bot. Gard. Mem. 1: 513–521. *6 pl.* July, 1918. (See Bot. Absts. 1, Entry 952.)] Zeitschr. Pflanzenzücht. 7: 221–222. June. 1920.

1624. Anonymous. [German rev. of: Wohanka and Company. **28. Jahresbericht der Rübensamenzüchtungen von Wohanka & Comp.** (**28th annual report of the beet breeding of Wohanka & Co.**) *95 p., 5 fig.* Wohanka & Co.: Prag, 1918.] Zeitschr. Pflanzenzücht. 6: 196. Dec., 1918.

1625. Anonymous. [German rev. of: Zade. **Die Versuche über Klee- und Gräserzüchtungen des landwirtschaftlichen Institutes Jena.** (**Experiments in clover and grass breeding of the Jena Agricultural Institute.**) Jahrb. Deutsch. Landwirtsch. Ges. 1918: 139–150. 1918.] Zeitschr. Pflanzenzücht. 6: 197. Dec., 1918.

1626. Anonymous. [German rev. of: Zinn, J., and F. M. Surface. **Studies on oat breeding. V. The $F_1$ and $F_2$ generations of a cross between a naked and hulled oat.** Jour. Agric. Res. 10: 293–312. 1917.] Zeitschr. Pflanzenzücht. 6: 197. Dec., 1918.

1627. Aumiot, J. **Rajeunissement et perfectionnement de la pomme de terre.** [**The rejuvenation and improvement of potatoes.**] Compt. Rend Acad. Agric. France 5: 905–910. 1919.—Several thousand potato seedlings were grown from crosses between cultivated varieties and also hybrids with *Solanum commersonii* and *S. maglia*. The plants were vigorous and flowered abundantly. The progenies varied in yield, and a table is appended giving the number and weights of the tubers. The experiments comprised 24 crosses between ten cultivated varieties and a hybrid between *S. maglia* × *S. tuberosum* var. Enowflack. The vigor and productivity were infinitely superior to the open-pollinated parents. The form and color of the skin and flesh were modified also. Many crosses with "Bolivienne 10bis" were free from rot and were resistant to *Phytophtora infestans*. The cross between *S. maglia* and *S. tuberosum* var. Enowflack was intermediate between the parents though tending to resemble more closely *S. tuberosum*.—A mutation from *S. maglia* to *S. tuberosum* is recorded. This mutant resembled the common cultivated potato in the characters of both plant and tubers. Three mutants were found in *S. commersonii* which resembled each other in tuber characteristics. It is stated that many mutants are suitable for cultivation, but one found in *S. maglia* has proved to be very susceptible to *Phytophtora infestans*. He concludes that although the uncultivated species of potatoes apparently are unpromising from the standpoint of obtaining varieties suitable for commercial cultivation, nevertheless entirely satisfactory mutants are found, and he believes that the potato can be improved rapidly through crossing.—*J. H. Kempton.*

1628. Bach, Siegfried. **Zweierlei Weisslinge bei Mais.** [**Two kinds of albinos in maize.**] Zeitschr. Pflanzenzücht. 7: 238–241. June, 1920.

1629. Baudouin, M. **Découverte d'un procéde sûr pour reconnaitre le sexe des axis humains à tout âge.** [**Discovery of a process for the certain recognition of sex in the human axis at all ages.**] Compt. Rend. Acad. Sci. Paris 167: 652–653. 1918.—The diameters of the foramen of the vertebral human axis from both sexes of various ages were measured. It was found that the difference between the anterior-posterior diameters and the transverse diameters of the foramina was very marked in the males while in the females it was always very slight.—*D. D. Whitney.*

1630. Bauer, J. **Aufgaben und Methoden der Konstitutionsforschung. [Problems and methods of study of the constitution.]** Wiener klin. Wochenschr. 32: 273–276. 1919.—Research on variations in the constitution has as its ultimate aim an explanation of inter- and intra-racial differences in anatomical and functional conditions, with special reference to the influence of these conditions on the incidence and course of disease. The various types of habitus that have been proposed are of great importance, but need careful analysis and revision. A thorough study of the nature of factors determining a given habitus is especially needed. In the study of organs and organ systems care must be exercised in determining whether any particular characteristic owes its existence to a peculiarity inherent in the organ itself, is "autochthonous," or to influences brought about through intermediation of the neuro-glandular system. With reference to the incidence of disease we must determine to what extent constitutional predispositions are taxable for the incidence of different diseases, and whether or not there are some diseases whose occurrence is wholly dependent on more or less specific constitutional deficiency. It is also highly important to be able to recognize anatomical or functional constitutional weakness before it has already been exposed by disease. The author makes a plea for a clinico-hereditary study of every possible case, since only in that way may be obtained knowledge of the greatest value to practical medicine, public health, and eugenics.—*C. H. Danforth.*

1631. B(ean), W. J. **One-leaved ash (Fraxinus excelsior heterophylla.)** Kew Bull. Misc. Inf. [London] 1919: 390–391. 1919.—Seeds from this form gave part of the seedlings of the same type.—*E. Mead Wilcox.*

1632. Becker, J. **Serologische Untersuchungen auf dem Gebiete von Pflanzenbau und Pflanzenzucht. [Serological investigations in the realms of plant production and plant breeding.]** Landwirtsch. Jahrb. 53: 245–276. 1919.—See Bot. Absts. 6, Entry 1572.

1633. Benders, A. M. **Onze constitutie. [Our constitution.]** Genetica 2: 301–322. July, 1920.

1634. Benders. [Dutch rev. of: Lichtenstern, R. **Bisherige Erfolge der Hodentransplantation beim Menschen. (Results thus far achieved by the transplantation of testes in man.)** Jahreskurse f. ärztliche Fortb. April, 1920.] Genetica 2: 374–375. July, 1920.

1635. Bergman, Emanuel. **A family with hereditary (genotypical) tremor.** Hereditas 1: 98–106. *2 fig.* 1920.—In a Swedish family the author has observed hereditary tremor. A description of the disease and descriptions of the affected persons are given. The tremor is transmitted as a dominant in the family.—*K. V. Ossian Dahlgren.*

1636. Bezssonoff. **Sur l'obtention expérimentale de la sexualité chez les champignons et orientée sur la structure typique du plasma sexuel. [On the experimental production of sexuality in fungi and oriented on the typical structure of the sexual plasm.]** Compt. Rend. Acad. Sci. Paris 170: 288–290. 1920.—See Bot. Absts. 6, Entry 1344.

1637. Blaringhem, L. **Variations de la sexualité chez les Composées. [Variation of sexuality in the Compositae.]** Compt. Rend. Soc. Biol. [Paris] 83: 1060–1062. July, 1920.

1638. Blaringhem, L. **A propos de l'hérédité des fascies de Capsella Viguieri. [Concerning the heredity of fasciations in Capsella Viguieri.]** Compt. Rend. Acad. Sci. Paris 169: 298–300. 1919.

1639. Blaringhem, L. **Production par traumatisme d'une forme nouvelle de Mais à caryopses multiples, Zea Mays var. polysperma. [The traumatic origin of a new form of maize with multiple fruits, Zea Mays var. polysperma.]** Compt. Rend. Acad. Sci. Paris 170: 677–679. 1920.

1640. Blaringhem, L. **Variations florales chez la Grande Marguerite (Leucanthemum vulgare, Lamarck.)** [Floral variation in Leucanthemum vulgare.] Compt. Rend. Acad. Sci. Paris 169: 193–195. 1919.

1641. Boedijn, K. **Die Chromosomen von Oenothera Lamarckiana, mut. simplex.** [The chromosomes of Oenothera Lamarckiana mut. simplex.] Zeitschr. indukt. Abstamm. Vererb. 24: 71–76. Aug., 1920.

1642. Bouin, P. **Sur la dimégalie des spermies dans certaines doubles spermatogénèses. Sa signification.** [On dimegaly of sperms in certain cases of double spermatogenesis. Its significance.] Compt. Rend. Soc. Biol. 83: 432–434. Mar., 1920.—Two sorts of spermatogonia exist in *Scolopendra*, one with large, one with small chromosomes. Spermatogenesis is same in both except that growth is much greater in those with large chromosomes. Quantity of chromatin is held to cause larger growth. By analogy with another myriapod, large sperms are believed to be female-determining, small ones male-determining. Facts suggest that heterochromosome in forms that have one is merely trophic in function, that its chromatin is not different from that of other chromosomes, and that effect of its presence is due to larger amount of chromatin, not to different kind.—*A. Franklin Shull.*

1643. Bouvier, E. L., and d'Emmerez de Charmoy. **Mutation d'une Caridine en Ortmannie et observations générales sur les mutations évolutives de Crevettes d'eau douce de la famille de Atyidés.** [Mutation of a Caridine into Ortmannia, and general observations on the evolutive mutations of freshwater crustaceans of the family Atyidae.] Compt. Rend. Acad. Sci. Paris 169: 317–321. 1919.

1644. Castle, W. E. **Model of the linkage system of eleven second chromosome genes of Drosophila.** Proc. Nation. Acad. Sci. [U. S.] 6: 73–77. *2 fig.* Feb., 1920.—Bridges and Morgan's linkage data of the second chromosome of *Drosophila* form the basis of another model in three dimensions similar to those which Castle has previously published. It shows the second chromosome genes "lying roughly in a linear chain winding cork-screw fashion through the model." Gowen's data for the third chromosome have been subjected to similar treatment, and although the model is not figured the genes are said to fall "into a curved band lying nearly in one plane" in the manner pointed out by Sturtevant, Bridges, and Morgan for the sex chromosome model. It is now admitted that according to the linear idea, map distances in excess of 50 may occur, though double crossing over prevents them from being recorded, and that map distances do not correspond with crossover percentages except where the crossover values are low. The fact that one model closely approaches the linear, and that the indefinite lengthening of all the longer distances in the other—cutting of all wires over 40 units long—would straighten it out, so as to closely approach a linear system, leads to the following conclusion: "that the model supports the linear hypothesis, if it be supposed that the longer distances have been shortened by double crossing over, and that map distances in such cases should exceed crossover percentages.—*H. H. Plough.*

1645. Chodat, R. **La panachure et les chimères dans le genre Funkia.** [Variegation and chimeras in the genus Funkia.] Compt. Rend. Soc. Phys. Hist. Nat. Genève 36: 81–84. 1919.—Author studied chimera-like variegation in leaves of three species of *Funkia*. In *F. Sieboldiana* he found two contrasting types—*variegata albo-marginata* with largely white-margined leaves, and *variegata medio-variegata* with the white portion largely in the center of the leaf. Baur considers several of these variegated types, such as are found in *Euonymus* and *Pelargonium*, as periclinal chimeras. Author finds in variegated *Funkias* that none of the usually colorless sub-epidermis is present above the green regions; hence he questions considering them as periclinal chimeras, but uses this hypothesis in analyzing them. He does not consider *Funkia* variegations as reversions such as the variegations described by Bateson in *Euonymus*, because in *Funkia* the leaves are all of same type on one plant, while both normal and variegated leaves occur on the same plant in case of Bateson's studies.—In monocotyledons of the *Funkia* type the epidermis is colorless except for the green guard-

cells of the stomata. In *albo-marginata* the epidermis is entirely colorless. In the *medio-variegata* type the guard-cells are green over both the green and white regions. This was also observed in *F. ovato* f. *medio-variegata* and *F. lancifolia medio-variegata*, while in *F. lancifolia* f. *albo-marginata* the epidermis is absolutely colorless. In *F. Sieboldiana* Hook, *medio-variegata* there is an average of 18.7 stomata over the white region, and 14.5 over the green region, the stomata being much larger and less elongated over the green regions than over the colorless parts. The opposite is the case in *albo-marginata*, which averages 12.3 stomata over the green, and 11 over the white regions for the same surface area.—The origin of the variegated *Funkia* is probably a question of hybrids, the chimeras being of a disjunctive rather than of a periclinal type, some with white epidermis, and some with a green epidermis.—*Francena R. Meyer.*

1646. Coe, H. S., and J. N. Martin. **Sweet-clover seed. Part I. Pollination studies of seed production. Part II. Structure and chemical nature of the seed coat and its relation to impermeable seeds of sweet clover.** U. S. Dept. Agric. Bull. 844. *39 p., 6 fig., 5 pl.* 1920.—Brief descriptions are given of development of floral organs, ovules, pollen, and seed of sweet clover, *Melilotus alba*, mainly, and also *M. officinalis*. Self-fertilization is as effective as cross-fertilization, judging by length of time elapsing between pollination and fertilization in the two cases and also by comparative rate of embryo development. Pollen germination was 33 per cent in pure water, and from 22 to 64 per cent in cane sugar solutions with strengths from 8 to 45 per cent; germination was best in 12 per cent solution. Pollen tubes made no more growth in sugar solution than in water; so it is concluded that sugar helps in pollen germination by reducing absorption rate of water. There would seem to be no reason *per se* why pollen germination should not take place freely in the open under wet weather conditions; and germination was found to take place under these conditions.—Sweet clover plants protected to prevent access to insects had only 2.9 per cent of the flowers set seed, while unguarded plants had 66.5 per cent. The percentage of cross-pollinated flowers setting seed was 70.1, while the percentage of self-pollinated flowers setting seed was 54.9. Night-flying insects seemed to have but minor effects on fertilization. Many species of insects were found to visit sweet clover. Small insects were found to be efficient pollinators. The honey bee is evidently the most efficient pollinator of sweet clover; species of *Halictus* are often nearly as efficient. Excess moisture, in the air or soil, did not affect seed production adversely. Dry soil conditions tended to inhibit seed production.—In histological studies of permeable and impermeable (hard) seeds, the "light line" of Malpighian layer, the chemical nature of which was not determined, was found to be a determining factor. In permeable seeds minute canals were found to traverse the light line radially, allowing water to pass through. These were not visible in impermeable seeds until treated with sulphuric acid, and were then observed to be very small. Seed treatment with acid for one hour did not disintegrate light line, but rendered seeds permeable.—*L. R. Waldron.*

1647. Collins, G. N. **Waxy maize from Upper Burma.** Science **52**: 48–51. July 16, 1920.—Maize with waxy endosperm has been found in Upper Burma where it is cultivated by uncivilized tribes in the inaccessible mountainous districts. It is grown chiefly for the husks, which are used as wrappers for the enormous cheroots affected by the Burmese.—Plants grown in the United States from the Burma waxy seed were very unlike those raised from the original Chinese waxy seed, but the endosperm texture proved to be genetically identical.—A survey of the region in China where the first waxy seeds were discovered has shown that this type of corn is restricted to a region within 30 miles of Shanghai, and no distinctive Chinese names differentiating the waxy from other types were found. Apparently the waxy type has been cultivated in Burma for a longer period, since there is an extensive series of named varieties and the distribution is more general.—Waxy endosperm has been found also on the Island of Mindanao by W. H. Weston, but it can not be determined whether the occurrence of this type in the Philippines is the result of a recent introduction from the Chinese source or whether it represents another of the early stations comparable with Burma and Shanghai.—The author believes the waxy endosperm to have originated in

northern Burma and to have been imported into China from this district at an early date. This conclusion supports the contention of Dr. Laufer that maize entered China from the West and not the East.—*J. H. Kempton.*

1648. Collins, G. N., and J. H. Kempton. **A teosinte maize hybrid.** Jour. Agric. Res. 19: 1–38. *Pl. 1–7. 32 fig.* 1920.—A study of a hybrid between Florida teosinte and a small variety of maize known as Tom Thumb pop. Besides possible practical agricultural applications of the product, such a cross is of especial interest genetically because of the rare opportunity of securing fertile hybrids from such widely divergent parent forms. Characters of the $F_1$ were mainly intermediate. Observations were taken on 33 character pairs of the $F_2$, being considered in groups according to certain morphological or physiological relationship. Results are presented graphically in form of distribution curves. There was the greatest freedom of recombination and, barring one or two exceptions, little evidence of alternative or Mendelian inheritance.—*L. H. Smith.*

1649. Conklin, Edwin Grant. **The mechanism of evolution in the light of heredity and development. V. The cellular basis of ontogeny and phylogeny.** Scientific Monthly 1920: 269–291. *11 fig.* Mar., 1920.—A summary and restatement of present-day conceptions of the cell in reference to ontogeny and phylogeny. The physical basis of heredity and of evolution is contained in the germ cells, which form the only living bond between generations and between species. There is "no fundamental distinction" between germ cells and somatic cells. Up to an undetermined critical stage, either may under certain conditions give rise to the other. There are, however, marked morphological and physiological differences between the germplasm (nucleus) and somatoplasm (cytoplasm). The individuality of the chromosomes "is no longer a mere hypothesis, but an established fact;" and every chromomere will probably be found to have a distinct and continuous entity, the number remaining constant for every species. The smaller units which enter into the organization of the cell are alive, as is the whole cell. These divide equally, not differentially. Variations in combinations of vital units are responsible for "all forms of differentiation, variation, and evolution." The problem of the mechanism of heredity must be studied both from the side of cytology and of genetics. All the evidence at hand strengthens the assumption that genes have a linear arrangement in the chromosomes. A statement and brief discussion of the facts, as known today, regarding mitosis in general, meiosis, fertilization, sex determination, sex-linked characters, linkage, "cross-overs," etc., lead clearly to the conclusion that the inheritance units or genes or Mendelian factors are carried in the chromosomes.—*Margaret C. Ferguson.*

1650. Conners, C. H. **Some notes on the inheritance of unit characters in the peach.** Proc. Amer. Soc. Hortic. Sci. 16: 24–36. (1919) 1920.—Blossoms of peaches are classified as large, medium, and small. Of 50 trees of a self-pollinated small variety, 46 bore small-sized blossoms. Crosses between small- and large-blossom varieties gave first generation seedlings with medium-sized blossoms.—Varieties with medium-sized blossoms, when self-pollinated, gave large-, medium-, and small-blossom seedlings in percentage ratios of 18.6, 58.2, and 23.3, respectively.—Medium crossed with small gave large-, medium-, and small-blossom seedlings in percentage ratios of 4.5, 61.4, and 34.1, respectively. Medium crossed with large gave large-, medium-, and small-blossom seedlings in percentage ratios of 36.5, 58.7, and 4.9, respectively.—The breeding behavior for color of fruit, date of ripening, and freestone *versus* clingstone, is given for various "selfed" varieties and crosses.—*Fred Griffee.*

1651. Copeman, S. Monckton. **Experiments on sex determination.** Proc. Zool. Soc. London 1919: 433–435. Feb., 1920.—Rabbits were semicastrated or semi-spayed either on the left or the right side, and then bred with animals which had had a similar operation or with entire animals of the opposite sex. This was done in an attempt to determine whether the right or left gonads were prepotent in determining the resulting sex of the offspring. The results were contradictory, and the general conclusion was that the reproductive cells of a gonad may give rise to either sex.—*D. D. Whitney.*

1652. Correns, C. **Vererbungsversuche mit buntblättrigen Sippen. III. Veronica gentianoides albocincta. IV. Die albomarmorata- und albopulverea-Sippen. V. Mercurialis annua versicolor und xantha.** [Genetical studies with variegated races. III. Veronica gentianoides albocincta. IV. The albomarmorata and albopulverea races. V. Mercurialis annua versicolor and xantha.] Sitzungsber. Preuss. Akad. Wiss. Berlin 6, 7: 212-240. 1920.

1653. Crandall, C. S. **The apple cross—Tolman × Malus Toringo.** Proc. Amer. Soc. Hortic. Sci. 16: 60–66. (1919). 1920.—Cross between Tolman, a standard variety of apple, and a dwarf form of *Malus Toringo* gave $F_1$ seedlings intermediate for characters studied, but more nearly approaching dwarf parent.—See also Bot. Absts. 6, Entry 1148.—*Fred Griffee.*

1654. Czuber. **Die Anwendung der Wahrscheinlichkeitsrechnung auf Fragen der Landwirtschaft.** [The application of probability calculations to agricultural questions.] Zeitschr. Landw. Versuch. Österreich. 1918: 1–100. 1918.

1655. Danforth, C. H. **Observations on brachydactylism in the fowl.** Anat. Rec. 14: 33–34. 1918.—Author's abstract of paper presented at the Thirty-fourth session of the American Association of Anatomists, Dec. 29, 1917.—A form of brachydactylism affecting particularly the fourth digit is of common occurrence in the fowl. It is usually associated with booting (feathered tarsi). The extent to which the fourth toe is shortened ranges from a condition in which all five phalanges are present, but with a total length slightly less than normal, to a condition in which the toe is greatly shortened and the number of phalanges reduced to two. The fourth phalanx is the first to be affected, followed by the third, and then by the fifth. The skeletal elements seem to disappear through a process of coalescence rather than one of suppression.—Examination of developmental stages show that the brachydactyl digits are already noticeably shortened at a time when the cartilaginous anlagen of the phalanges are still in a rudimentary condition, which suggests that the brachydactylism is due not to a defect inherent in the skeletal system, but more probably to an influence that acts on the toe as a whole. The possibility of booting as a causative factor seems to be definitely eliminated by the fact that brachydactylism may be clearly apparent before the first feather germs appear on the tarsi. It seems probable that both conditions are induced by some common cause, which is effective from the eighth to the tenth day of incubation.—Breeding records indicate that brachydactylism is transmitted in about the same proportions as polydactylism and booting. With the latter it shows a close correlation; with the former, none.—*C. H. Danforth.*

1656. Daniel, Lucien. **Sur la stabilité et l'hérédité de Crataegomespilus et des Pirocydonia.** [On the stability and heredity of Crataegomespilus and of Pirocydonia.] Compt. Rend. Acad. Sci. Paris 169: 513–515. 1919.

1657. Davenport, C. B. **Department of Experimental Evolution.** Carnegie Inst. Washington Year Book 18 (1919): 123–152. 1920.—Director reports that during 1919 scientific work of the Station emerged from quiescence imposed by the war. C. W. Metz, working with *Drosophila virilis*, *D. obscura* and *D. willistoni*, discovered 23 new mutant characters from March to July. E. C. MacDowell reports no new experimental facts on effects of alcohol on rats, but presents further surveys of data previously collected. One such survey points to mental inferiority of rats descended from alcoholized grandparents as compared with controls from normal ancestors. Cytological studies (by E. Allen) on testes of control and alcoholized rats revealed degeneration in both, but much more in alcoholized rats. A biometrical treatment by MacDowell on data already reported on selection for bristle number during 54 generations of *Drosophila* confirmed previous conclusions that no selection effect was perceptible after first few generations. Compilation by A. M. Banta of data on selection for speed of light reaction in daphnids showed no effective selection except in one line. E. H. Behre found that stale sperm in pigeons does not affect sex-ratio. Banta continued observations on sex-intergrading daphnids along two lines: (1) detailed study of

degrees of intergrading, which revealed all conceivable intermediate stages with maleness and femaleness blended and not in sexual mosaics as in gynandromorphs, and showed that the degree of maleness in different parts of a single individual varied; (2) selection within intergrade stocks descended from one original mother toward pure femaleness, which has given results in direction of selection. Banta has continued comparative studies on cave animals raised in light and epigaeal animals raised under cave conditions. C. C. Little, using records of Sloane Maternity Hospital of New York, found ratio of male to female birth from parents of same race to be 106.27, while in "hybrid" matings this ratio was 121.56; it would seem from this that male-producing sperms are less likely to be eliminated. Little has also reviewed literature on cats, doves, and canaries to see how completely facts of inheritance agree with general crossing-over and non-disjunction hypotheses. With Miss E. E. Jones he has studied heredity of color in dogs, basing conclusions on stud books of American Kennel Club; three double allelomorphic and one triple allelomorphic series have been found. Genetical experiments have been pursued also on sheep, mice, and poultry. Oscar Riddle, with collaborators, has completed demonstration of nitrogen reduction in eggs accompanying quinine dosage, and of fact that brains of ataxic birds lack chemical differentiation. Of work of Eugenics Record Office reference is made to H. J. Banker's studies; to C. B. Davenport's studies of statistics on drafted men for Surgeon General's Office, Washington; to Davenport and Scudder's contribution on naval officers, which showed that hereditary traits—i.e., hyperkinesis, thalassophilia, and nomadism—determined superiority; and to Miss M. M. Sturges's investigation of isolated inbred communities. H. H. Laughlin has prepared a work on eugenical sterilization in the United States, and has made statistical inquiries on elimination of mongrel blood in pure-sire system of out-breeding. Much eugenical material has been added to archives during the year.—*James P. Kelly.*

1658. Davenport, C. B. **Hereditary tendency to form nerve tumors.** Proc. Nation. Acad. Sci. 4: 213–214. Aug., 1918.—Multiple neurofibromatosis, a condition due mostly to the proliferation of connective tissue in nerve sheaths, shows a strongly familial tendency. It is not limited to either sex and is generally transmitted after the fashion of a Mendelian dominant. In a few instances a generation has been skipped, but these occurrences are probably to be explained on the basis of an occasional failure of dominance. The symptoms of the disease are diverse, but within a given family they are generally rather uniform. The fact that these neurofibromata are hereditary tends to strengthen the view that cancers in general have an hereditary basis.—*C. H. Danforth.*

1659. Duarte d'Oliveira, José. **Sur la transmission de la fasciation et de la dichotomie a la suite de la greffe de deux vignes portugaises.** [**The transmission of fasciation and dichotomous branching through the grafting of two Portuguese varieties of grapes.**] Compt. Rend. Acad. Sci. Paris 170: 615–616. 1920.—See Bot. Absts. 6, Entry 1151.

1660. Duerden, J. E. **Inheritance of callosities in the ostrich.** Amer. Nat. 54: 289–312. 7 *fig.* July–Aug., 1920.—Author describes several callosities appearing regularly on body of the ostrich, distinguishing three classes: (1) those inherited (because constantly present before hatching), and functioning under certain circumstances as cushions bearing the weight of the bird, or as friction pads; (2) those inherited, but not now functioning; and (3) those which are direct individual responses of the skin to contact, involving pressure and friction, with hard substances. Callosities of latter class may be developed on the skin of other parts of body, and presumably on any part. Callosities of all three classes are similar in structure. The author suggests that those of classes 1 and 2 originally arose as adaptive responses, which have since become transmissible. Those of class 2 are no longer used, owing to certain structural changes in body. Those of class 3, necessitated by same structural changes, have as yet not become heritable. He states that "a character may become transmissible without necessarily being germinal, in the sense of having factorial representation in the germ plasm;" and that "acquired characters are such somatic modifications as are produced as responses of the organs and tissues to stimuli, and are without direct representation in the germ plasm." —*William A. Lippincott.*

1661. Edler, W. **Die Verzweigung der Ackerbohne. [Branching of field beans.]** Fühlings Landwirtsch. Zeit. **1919**: 441–450. 1919.—An account is given of a ten years' mass selection experiment on varieties of *Vicia faba*. Branched and unbranched plants started groups within each variety. Within each group the choosing of branched and unbranched plants, respectively, was repeated. Branched plants in most seasons are more common in selections toward branching than in those toward single-stemmed condition, but increase in tendency toward branching has not been obtained after ten years' work. Outside conditions affect branching very markedly. [From anonymous review in Zeitschr. Pflanzenzücht. **7**: 210. June, 1920.]—*J. P. Kelly.*

1662. Ehinger, K. **Ein neuer tertiärer Deilephila-Hybride. [A new tertiary Deilephila hybrid.]** Entomol. Rundschau **37**: 2–4, 7–8. 1920.

1663. Ellinger, Tage. [German rev. of: Cushing, H. **Hereditary anchylosis of the proximal phalangeal joints (symphalangism).** Genetics **1**: 90–106. *11 fig.* Jan., 1916.] Zeitschr. indukt. Abstamm. Vererb. **24**: 104. Aug., 1920.

1664. Ellinger, Tage. [German rev. of: Schmidt, J. **Investigations of hops (Humulus lupulus). XI. Can different clones be characterized by the number of marginal teeth in the leaves?** Compt. Rend. Lab. Carlsberg **14**: 1–23. *8 fig.* 1918. (See Bot. Absts. 3, Entry 2192.)] Zeitschr. indukt. Abstamm. Vererb. **24**: 101. Aug., 1920.

1665. Fawcett, W. **Cebras e híbridos como animales domesticados. (Zebras and their hybrids as domestic animals.)** La Hacienda **13**: 242–245. *9 fig.* 1918.—Popular review of experiments in which zebras have been crossed with horses or asses, with special regard to the possible usefulness of the hybrids as farm animals.—*Sewall Wright.*

1666. Firket, Jean. **Recherches sur l'organogénèse des glandes sexuelles chez les oiseaux. [Researches on the organogenesis of the sexual glands in birds.]** Arch. Biol. **30**: 395–516. *6 pl., 5 fig.* 1920.

1667. Fischer, H. **Pflanzenmetamorphose und Abstammungslehre. [Plant metamormorphosis and evolution.]** Die Naturwissenschaften **8**: 268–271. 1920.

1668. Frölich, G. **Die Umzüchtung von Wintergetreide in Sommergetreide. [The breeding of winter cereals into spring cereals.]** Friedrichswerther Monatsber. **9**: 27–30. 1919.—In an experiment begun in 1906 to change by breeding the Friedrichswerther Squarehead barley into a summer sort, no shortening of period of time from sowing of seeds to shooting was obtained up to 1918. When considering influence of spring planting one must keep in mind the effects of selection of those plants that send up stalks earliest. Author noted that spring-sown barley gave a lessened crop, much stooling (Bestockung), and an absence of stalks in some plants. [From anonymous review in Zeitschr. Pflanzenzücht. **7**: 118. Dec. 1919.]—*J. P. Kelly.*

1669. Frölich, G. **Die Beeinflussung der Kornschwere durch Auslese bei der Züchtung der Ackerbohne. [The influencing of seed weight by selection in the breeding of field beans.]** Friedrichswerther Monatsber. **9**: 7–8, 17–20. 1919.—Author experimented to test report that in Thüringen, due to local external conditions, seed weight of field bean decreased. Individual seed weight proved strongly modifiable, considering weights for separate years; but a general decrease due to place conditions was not found. An increase in weight by selection within limits of a particular individual was in general without success. In some cases tendency was noted for branches to occur with higher separate seed weight, which author referred to occasional cross-pollination. [From anonymous review in Zeitschr. Pflanzenzücht. **7**: 117. Dec., 1919.]—*J. P. Kelly.*

1670. Fruwirth, C. **Handbuch der landwirtschaftlichen Pflanzenzüchtung. 3. Die Züchtung von Kartoffel, Erdbirne, Lein, Hanf, Tabak, Hopfen, Buchweizen, Hülsenfrüchtern und kleeartigen Futterpflanzen.** [**Handbook of agricultural plant breeding. 3. The breeding of potatoes, Jerusalem artichokes, flax, hemp, tobacco, hops, buckwheat, legumes, and clover-like forage plants.**] *3rd ed., 240 p., 45 fig.* Paul Parey: Berlin, 1919.—In present edition of this volume section on potatoes is fundamentally revised. Considerable change is made also in portions devoted to breeding of flax, hops, and tobacco. Presented in this edition for first time is discussion on breeding of Soy beans (*Soja*). Author touches on his own researches in potatoes, hemp, legumes, and clovers. There is an increase of 17 pages and 10 figures over last edition. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 222–223. June, 1920.] —*J. P. Kelly.*

1671. Fruwirth, C. **Die Saatenanerkennung.** [**Seed recognition.**] *iii + 126 p., 66 fig.* Paul Parey: Berlin, 1918.—See Bot. Absts. 6, Entry 1586.

1672. Gager, C. Stuart. **Heredity and evolution in plants.** *14 × 20 cm., xi + 265 p., 113 fig.* P. Blakiston's Son & Co.: Philadelphia, 1920.—Represents essentially a reprinting, with minor modifications, of chapters 31–38 of the author's "Fundamentals of botany," to which have been added a chapter on geographical distribution (p. 139–182) and one on the great groups of plants (pp. 243–251). A classified bibliography of books and a brief list of journals are also new. All but three of the books listed are in English, and the only foreign journals cited are the "New Phytologist," London, and the "Revue général de botanique," Paris.—*G. H. Shull.*

1673. Gardner, V. R. **Results of bud selection investigations at the Missouri and Oregon experiment stations and their interpretation.** Proc. Amer. Soc. Hortic. Sci. 16: 66–70. (1919) 1920.—Scions from high- and low-yielding Ben Davis trees (*Pyrus malus*) proved of equal value. Likewise, ten years selection for high and low yield in a standard strawberry variety had no effect on productiveness. Cases of degeneration in several seedling strawberries are given. This degeneration in one case involved the entire stock; in another case, only a part of the plants of a variety.—Crosses of wild *Fragaria chiloensis* with a cultivated variety gave mostly seedlings bearing petioles with appressed and ascending pubescence like that of the wild form. Some seedlings had petioles with spreading pubescence like that of the cultivated variety. One seedling bore petioles of both types. Propagations from this seedling gave daughter plants, some of which were like the wild form, some like the cultivated variety, and others with petioles of both types.—Author points out importance of eliminating degenerates as a means of keeping a variety up to standard. [See also Bot. Absts. 6, Entry 1155.]—*Fred Griffee.*

1674. Gates, R. R. **A preliminary account of the meiotic phenomena in the pollen mother-cells and tapetum of lettuce (Lactuca sativa).** Proc. Roy. Soc. 91: 216–223. *2 fig.* May, 1920.—A study of the pollen development of the Dwarf Perfection lettuce and a rogue from it, revealed no constant cytological difference between the variety and its rogue; but certain interesting features were observed in both. The elongated tapetal cells lie parallel with the longer axes of the loculi. In the binucleate phase of the tapetal cells the nuclei often present in appearance various synaptic stages. Every transition occurs between microspore mother-cells and tapetal cells. The members of a bivalent chromosome lie side by side and chiasmatypy often occurs. The author states that this phenomenon is here described for the first time in plants. There are 9 pairs of chromosomes, which fall into 3 groups as to size. The 10 chromosomes sometimes found in diakinesis may have resulted from the separation of the members of a pair or from a transverse segmentation of one of the bivalent chromosomes. The number of chromosomes may be reduced to 8 or 7 by a more or less complete fusion, end to end, of two bivalent chromosomes. The manner of coalescence of these chromosomes furnishes a probable basis for the phenomena of coupling or repulsion. The microspore mother-cells are divided into tetrads by cytoplasmic intrusions from the wall. These have no connection with the spindle. The few pollen grains maturing in a loculus are surrounded by a "cytoplasmic detritus from the tapetum."—*Margaret C. Ferguson.*

1675. Gauger, Martin. **Die Mendelschen Zahlenreihen by Monohybriden im Lichte der Dispersionstheorie.** [The Mendelian ratios in monohybrids in the light of the dispersion theory.] Zeitschr. indukt. Abstamm. Vererb. 22: 145–198. Mar., 1920.—The author examines numerical results of a number of breeding experiments and concludes that ratios actually observed agree with ratios of Mendelian theory as nearly as can be expected after taking account of the mathematically probable deviations of the series observed.—*R. B. Robbins.*

1676. Goldschmidt, Richard. **Untersuchungen über Intersexualität.** [Investigations on intersexuality.] Zeitschr. indukt. Abstamm. Vererb. 23: 1–199. *2 pl., 84 fig.* 1920.

1677. Gräfenberg, E. **Die entwicklungsgeschichtliche Bedeutung der Hyperdaktylie menschlicher Gliedmassen.** [Developmental significance of hyperdactyly in human extremities.] Stud. z. Pathol. d. Entwickl. 2: 565–619. 1920.

1678. Gutherz, S. **Das Heterochromosomen-Problem bei den Vertebraten. Erste Mitteilung: Untersuchung der frühen Oogenese der Hauskatze.** [The heterochromosome problem in vertebrates. I. Study of the early oogenesis of the domestic cat.] Arch. Mikros. Anat. 94: 338–364. 1920.

1679. Guyer, M. F., and E. A. Smith. **Transmission of eye-defects induced in rabbits by means of lens-sensitized fowl-serum.** Proc. Nation. Acad. Sci. (U. S.) 6: 134–136. Mar., 1920.—A brief account of experiments in which the writers appear to have been able to induce specific antenatal lens-defects in rabbits, transmissible to later generations even through the male line, by treatment of pregnant females with fowl-serum previously sensitized to rabbit-lens. Among 61 surviving young of such treated females, there were conspicuous eye-defects in 4 cases and noticeable defects in 5 others. No such eye-defects were found in untreated rabbits or in control treated with unsensitized fowl-serum (12 cases) or with fowl-serum sensitized to another rabbit tissue (36 cases). Similar eye-defects were also occasionally induced in mice by similar methods. The defective eyes in rabbits have been transmitted for 6 generations with increasing severity.—*Sewall Wright.*

1680. Haecker, V. **Über Regelmässigkeiten im Auftreten erblicher Normaleigenschaften, Anomalien und Krankheiten beim Menschen.** [On regularity in the occurrence of hereditary normal characteristics, anomalies and diseases in man.] Mediz. Klinik. 14: 977–982. 1918.—The mode of inheritance of a trait is dependent upon the germinal complex which enters into the zygote and also upon the developmental relations of the organ or part in which the trait appears—the ontogenetic factor. If the part concerned has a high degree of developmental autonomy—that is, if it acquires relative independence at an embryologically early period—the trait is transmitted in ordinary Mendelian fashion. If there is a low degree of autonomy with a consequent involvement of various developmental influences, simple Mendelian heredity with segregation of traits does not occur, but, instead, a blending type from which neither of the original parental forms is ever reproduced in any subsequent generation. The blue eye color of certain Eskimos and others, shows the long-continued persistence of an autonomous, and consequently Mendelian, character; the slightly mongoloid features of some Hungarians and Turks represent the last vestige of blending traits. What sometimes appears as a single trait need not necessarily be such. For example, in the case of albinism there is an autonomous and a degenerative type. The former behaves in a clearly cut Mendelian fashion, while the latter, which is in reality the labile expression of a generalized degenerative condition, behaves in an irregular manner alternating with, or being accompanied by, various other aberrant conditions. Among digital anomalies, hypophalangy—a trait presumed to be due to a single factor directly affecting only skeletogenous elements and therefore displaying a high degree of autonomy—is a good Mendelian trait, while polydactyly —due to factors affecting several different elements and thus showing a low degree of autonomy—is transmitted irregularly and is often replaced by some other condition such as syndactyly.—The characteristic failure of blending characters to show Mendelian heredity may be due (1) simply to the extremely polyhybrid nature of the cross, (2) to a redistribution of the

genes between pairs of homologous chromosomes, or (3), especially in the case of disease conditions, to a tendency on the part of the germplasm to return by degressive mutations to the normal and presumably more stable condition.—*C. H. Danforth.*

1681. Hansen, W. **Einiges über Rübenzucht. [Something about beet-breeding.]** Illustr. Landw. Zeitg. **39**: 154–156. 1919.—Author advocates permitting open-pollination among best mother-beets and subsequent evaluation based on progeny performance. A single seed obtained under a gauze bag gave a poor result as revealed by progeny test. Determination of dry weights of beets in addition to polarization was deemed unnecessary. Suggests designating beet by letters in genetical studies. [From author's abstract in Zeitschr. Pflanzenzücht. **7**: 120. Dec., 1919.]—*J. P. Kelly.*

1682. Hansen, W. **Die Pflanzenzüchterische Buchführung und Bewertung der Zuchtpflanzen. [Plant-breeding book-keeping and evaluation of the parent plants.]** Zeitschr. Pflanzenzücht. **6**: 119–138. *2 fig.* Dec., 1918.

1683. Hansen, W. **Gedanken über Organisation und Arbeitsersparnis in der Pflanzenzucht. [Thoughts on organization and labor-saving in plant breeding.]** Deutsch. Landw. Presse **1918**: 261–262. 1918.—See Bot. Absts. 6, Entry 1587.

1684. Hansen, W. **Die Ermittlung des Einzelkorngewichtes einer Pflanze. [Determination of the weight of individual grains of a plant.** Zeitschr. Pflanzenzücht. **7**: 225–227. June, 1920.

1685. Hargitt, George T. **Coelenterates and the evolution of germ cells.** Anat. Rec. **17**: 327. Jan., 1920.—Author's abstract of paper read before the American Society of Zoologists, St. Louis, December 30, 1919.—In the Hydrozoa the observations upon germ-cell origin and segregation, budding, regeneration, and development from dissociated cells have led to the following conclusions: All cells of the body (except possibly the nettling and nerve cells) are capable of further differentiation in various directions; this includes the power of dedifferentiation and of specialization in a new direction. There cannot be, therefore, any real distinction between body cells and germ cells.—Specialized cells of other adult animals (including vertebrates) show, in varying degrees, the power of dedifferentiation and new specialization. The capacity for specialization in different directions is universally present in the cells of embryos or of larvae, and sometimes throughout the youthful stages. But there is a time in ontogeny when further specialization of cells involves the loss of capacity for any new differentiation; this is the period at which germ cells are usually segregated into a distinct tissue. In the higher organisms this may occur early in ontogeny; in Hydrozoa it never occurs.—*George T. Hargitt.*

1686. Harland, S. C. **Studies of inheritance in cotton. I. The inheritance of corolla colour.** West Indian Bull. **18**: 13–19. 1920.—"It would easily be possible to collect a hundred or more different pure-breeding West Indian natives." Existence of so large a number of homozygous biotypes is attributed to long-continued isolation in gardens. Present paper deals with artificial hybrids of some of the "native" cottons with Upland and with Sea Island. —Author distinguishes 6 grades of color from white (grade 0) to very deep yellow (grade 5), all breeding true. Ten different combinations were made among these. "A cross between any two of the above shades gave an intermediate $F_1$. In all $F_2$ families, the parental and $F_1$ color types appeared, but there may have been other intermediate colour forms in addition." In $F_2$ of the most extreme cross ($0 \times 5$) the distribution was: very deep yellow, 1; intermediate, 72; white, 4. An $F_3$ of this combination was not grown. The combination $0 \times 3$ gave in $F_2$ a ratio of 4.4 yellow : 1.0 white. In $F_3$, 8 families from $F_2$ yellows produced yellows only, and 27 families from $F_2$ yellows produced yellows and whites in an approximately 3 : 1 ratio, but with considerable deviation from this ratio in certain families. Of 11 families from $F_2$ whites, 6 produced an occasional yellow in $F_3$, but possibility of accidental cross-pollination as an explanation is not excluded. "It is not without hesitation that the hypothesis that medium yellow and white constitute an allelomorphic pair is put forward."—*T. H. Kearney.*

1687. Harman, Mary T. **Chromosome studies in Tettigidae. II. Chromosomes of BB, CC, and the hybrid BC in the genus Paratettix.** Anat. Rec. 17: 329. Jan., 1920.—Author's abstract of paper read before the American Society of Zoologists, St. Louis, December 30, 1919.—BB, CC, and their hybrids, BC (Nabours, 1914 and 1917), are the only forms considered in this paper. Six pairs and an unpaired chromosome are present in the spermatogonia. In BB the chromosomes of the third pair, according to size, taper toward one end and are bent so as to have almost the appearance of a hook. In CC the chromosomes of this pair are nearly oval. In the hybrid, BC, this pair of chromosomes is composed of an oval chromosome like that in CC and a bent chromosome like that in BB. The difference in this homologous pair of chromosomes is recognized at the end of the growth period previous to the formation of the chromosomes of the first maturation spindle.—The diploid number of chromosomes appears at the end of the growth period previous to the formation of the bivalent chromosomes. The bivalent chromosomes are formed by an end-to-end union of the homologous pairs of these chromosomes before they have been completely condensed. The sex chromosome may be recognized at all stages.—In the first maturation division the bivalent chromosomes separate at the line of union, and the sex chromosome goes to one pole undivided. The formation of the diploid number of chromosomes at the end of the growth period and the union, end to end, of their homologous pairs may explain the absence of any crossing-over in *Paratettix.—Mary T. Harman.*

1688. Hartwell, Burt L. **Thirty-second annual report of the Director of the Rhode Island Agricultural Experiment Station.** Bull. Rhode Island State Coll. **15**: 69–84. Feb., 1920.—Brief statement on pages 82, 83, of inheritance studies with poultry and rabbits.—*G. H. Shull.*

1689. Heribert-Nilsson, Nils. **Zuwachsgeschwindigkeit der Pollenschläuche und gestörte Mendelzahlen bei Oenothera Lamarckiana. [Decline in pollen-tube growth and deranged Mendelian ratios in Oenothera Lamarckiana.]** Hereditas **1**: 41–67. *1 fig.* 1920.—Author has investigated the rate of growth of pollen tubes by cutting off the base of the style at certain intervals of time after pollination. Temperature influences considerably the velocity of growth of the pollen-tubes.—*Rr* (red-nerved) × *rr* (white-nerved) give the typical Mendelian segregation 1 : 1. The inverse cross (*rr* × *Rr*) gives too large proportion of red-nerved plants. The *R* tubes grow more rapidly than the *r* tubes, and consequently fertilize a number of eggs before the *r* tubes arrive. in 1918 segregations up to 4: 1 were obtained. Competition between *R* and *r* is termed *certation*, and the cross *rr* × *Rr* a *certation-cross*. The inverse cross is called an *equation-cross*. Difference in the influence of temperature between the *R* and *r* tubes is to be interpreted in such a way as to explain the slow growth of the *r* tubes becoming relatively still more retarded when the temperature falls.—By self-fertilization of *Rr* plants we meet besides certation other complications. All the red-nerved plants are heterozygous, *Rr*. The combination *RR* can not be produced. Consequently a segregation in the ratio 2 *Rr*: 1 *rr* is to be expected. However, the author obtained too many *Rr* plants. No elimination of *RR* zygotes takes place, but there is a repulsion between the *R* gametes, a "prohibition." All the *R* eggs are fertilized by *r* pollen. The compensation of the *R* pollen with *r* pollen in the fertilization of the *R* eggs receives the name "*substitution.*" Thus the ratio 2 *Rr* + 1 *rR* to 1 *rr* is obtained; that is, the segregation 3: 1. By coöperation of certation the segregation is found to be 6: 1 in extreme cases. The irregular segregation stated by de Vries can be explained by the complications characteristic of the factor *R*. The more *Oenothera Lamarckiana* is examined, the more the variability proves itself not to be a phenomenon *sui generis.—K. V. Ossian Dahlgren.*

1690. Heribert-Nilsson, N. [German rev. of: von Hofsten, N. **Ärftlichetslära. [Genetics.]** *17 × 26 cm., viii + 506 p., 191 fig., 1 colored pl.* P. A. Norstedt & Söners förlag: Stockholm. 1919. (See Bot. Absts. 3, Entry 2208.)] Zeitschr. indukt. Abstamm. Vererb. **24**: 98. Aug., 1920.

1691. Herlant, Maurice. **L'acide carbonique comme agent de parthénogénèse expérimentale chez l'oursin (Paracentrotus).** [Carbonic acid as an agent of experimental parthenogenesis in the sea-urchin (Paracentrotus).] Compt. Rend. Soc. Biol. 83: 188–190. 1920.

1692. Hertwig, Günther. **Das Schicksal des väterlichen Chromatins im Kreuzungsexperiment.** [The fate of paternal chromatin in the crossing experiment.] Arch. Mikrosk. Anat. 94: 288–302. *1 fig.* July 15, 1920.

1693. Hertwig, Oscar. **Allgemeine Biologie.** [General biology.] 5th ed., improved and enlarged, *8vo., xvi + 800 p.* Gustav Fischer: Jena, 1920.

1694. Hertwig, Paula. **Abweichende Form der Parthenogenese bei einer Mutation von Rhabditis pellio. Eine experimentell cytologische Untersuchung.** [Aberrant form of parthenogenesis in a mutation of Rhabditis pellio. An experimental cytological study.] Arch. Mikros. Anat. 94: 303–337. 1920.

1695. Hertwig, Paula. **Haploide und diploide parthenogenese.** [Haploid and diploid parthenogenesis.] Biol. Zentralbl. 40: 145–174. April–May, 1920.—Summary of known facts concerning maturation and development in artificial and physiological parthenogenesis. Stimuli to artificial parthenogenesis are classed as chemical, physical, and biological. Time at which stimulation acts determines, in different material, whether development starts with diploid or haploid number of chromosomes. As a rule number is haploid. Later, from natural or artificial causes, it may become diploid. Specific examples are given, and literature is cited. Development of artificially parthenogenetic eggs is mostly of short duration. Author points out that complete development in presence of only haploid number of chromosomes has so far proven impossible. Defect is hardly in mere number of chromosomes, but perhaps in interrelation of nucleus, protoplasm, and yolk. It is questionable whether normal development can occur even in physiological parthenogenesis in presence of haploid number of chromosomes. Evidence at hand does not prove that it can.—Cases are mentioned in which natural parthenogenesis occurs in animals in absence of reduction, and comparable phenonena in plants are described. In no case in plants has development occurred with haploid nuclei in a generation normally diploid. In animals of Hymenopteran type, egg undergoes normal reduction whether it later develops parthenogenetically or is fertilized, and sex depends on presence or absence of fertilization. In some of those developing parthenogenetically with haploid nuclei, number of chromosomes is later doubled, at least in somatic cells. Cytology of honey bee is critically considered in this connection.—*A. Franklin Shull.*

1696. Hochè, Léon, and René Morlot. **Evolution parthénogénétique de l'ovule dans l'atrophie de follicule a l'état de maturité.** [Parthenogenetic development of the egg to maturity in a case of atrophy of the follicle.] Compt. Rend. Soc. Biol. 83: 1152–1154. July, 1920.

1697. Hromádko, J. **Variabilität der Nachkommenschaft derselben Futterrübenmutter in der 1. Generation.** [The variability of progenies of the same mother beet in the first generation.] Zeitschr. Zuckerindus. Böhmen 42: 581–601. 1918.

1698. Jollos, Victor. **Experimentelle Vererbungsstudien in Infusorien.** [Experimental studies of heredity in Infusoria.] Zeitschr. indukt. Abstamm. Vererb. 24: 77–79. Aug., 1920.

1699. Jones, D. F. **Selective ferti'ization in pollen mixtures.** Biol. Bull. 38: 251–289. May, 1920.—By the use of the ingenious system of reciprocal crosses the author shows decisively that in *Zea mays* self-fertilization, although detrimental to the development of the progeny, is favored at the expense of cross-fertilization. Using the increase in the percentage of the cross-pollinated seeds as an indication of the germinal differences between the parents, the author calculated the correlation coefficient between the percentage of increase and the percentage of deviation in favor of self-fertilization, and found it to be $0.496 \pm 0.093$. He concluded from this coefficient that, "In proportion as the cross-fertilization benefits the

immediate progeny in its development the less effective is that pollen in accomplishing the union." The experiments with maize involved the classification of 63,000 seeds, arising from the use of 22 pollen mixtures, obtained from twelve strains. Of the 20 mixtures which were analyzed on seed characters alone, 17 showed selective fertilization in favor of the plant's own pollen, while three of the mixtures showed the opposite effect. Similar results were obtained in *Lycopersicum esculentum*, but the data were not so extensive. The author attributes the differential fertilization to the more rapid growth of pollen tubes in the stigmas of the parent plant and suggests anaphylaxis as a possible cause of the selective action.—*J. H. Kempton.*

1700. Jones, D. F. **Selective fertilization in pollen mixtures.** Proc. Nat. Acad. Sci. U. S. 6: 66–70. Feb., 1920.—Pollen of A and B types of corn was thoroughly mixed and applied to silks of both A and B. Resulting ears showed mixtures of hybrid and self-fertilized seed, distinguishable by endosperm characters. Ratio of selfed to crossed seeds on A ears should have had same value as ratio of crossed to selfed on B, provided no selective pollination occurred. In 20 extensive experiments, results of 3 showed foreign pollen favored. 17 showed own pollen favored, 15 of which were unquestionably significant. Less extensive experiments on tomato gave similar but not conconclusive results. Results were surprising in view of advantages of hybrid vigor. It was further shown that the wider the cross, the more was own pollen favored; "in proportion as the cross-fertilization benefits the progeny, the less effective are the germ cells in accomplishing fertilization." Results were the same irrespective of vigor or heterozygosity of parents used. Idea is refuted that union of diverse sexual elements stimulates growth through upsetting balance in protoplasm; instead, hybrid vigor is explained on basis of pure inheritance. Other things being equal, it is homogeneity in protoplasmic structure that favors highest developmental efficiency.—*Merle C. Coulter.*

1701. Jones, D. F. [Rev. of: Coulter, John M., and Merle C. Coulter. **Plant genetics.** *13 × 19 cm., ix + 214 p., 40 fig.* Univ. Chicago Press: Chicago. July, 1918. (See Bot. Absts. 2, Entry 395.)] Science 48: 346–347. Oct. 4, 1918.

1702. Just, Günther. **Der Nachweis von Mendel-Zahlen beim Formen mit niedriger Nachkommenzahl. Eine empirische Prüfung der Geschwister- und Probandenmethode Weisbergs auf Grund von Kreuzungsversuchen mit Drosophila ampelophila Löw.** [The determination of Mendelian ratios in forms with low number of offspring. An empirical test of Weisberg's methods on the basis of crossing experiments with Drosophila ampelophila Löw.] Arch. Mikros. Anat. 94: 604–652. 1920.

1703. Kalt, B. **Der Begriff "Originalsaatgut" und seine Anwendung bei der Züchtungsanerkennung.** [The concept "original seed" and its application in the recognition of breeding.] Fühlings Landwirtsch. Zeit. 1919: 460–471. 1919.

1704. Kammerer, Paul. **Dunkeltiere im Licht und Lichttiere im Dunkel.** [Darkness animals in light and light animals in darkness.] Naturwissenschaften 8: 28–35. 1920.

1705. Kiessling, L. **11. Bericht der bayrischen Landessaatzuchtanstalt in Weihenstephan. (1914–1918).** [11th report of the Bavarian Seed-breeding Institution at Weihenstephan (1914–1918). Landw. Jahrb. f. Bayern 1919: 1–178. 1919.—General report for years 1914–1918 presented under seven following headings: (1) History of institution, in connection with which is given picture of C. Kraus, founder. (2) Researches of institution; accounts of breeding work presented here and of agreements concerning delivery of pedigreed seed-stock for increase or further breeding. (3) Extension work and publications. (4) Bavarian seed-breeding localities; given here are principles governing creation of increase stations. (5) Section on promotion of seed-growing, where statistics on variety classification at certain places and where discussion of stations for culture of potato and vegetable seeds are given. (6) Agricultural promotion work. (7) Associational work of district agricultural societies, of Bavarian Seed-breeding Union and of Beet ("Rüben") Breeding Union. [Prepared from anonymous review in Zeitschr. Pflanzenzücht. 7: 213–214. June 1920.]—*J. P. Kelly.*

1706. Kiessling, L. C. Kraus. Zeitschr. Pflanzenzücht. 6: 222–225. Dec., 1918.

1707. Kiessling, L. **Die Leistung der Wintergerste und deren züchterische Beeinflussung. [The yield of winter barley and its modification by breeding.]** Illustr. Landw. Zeit. 1919: 310–311. 1919.—Author reviews the many varieties of two- and four-rowed barleys and indicates aims of breeding; namely, to secure as short-lived a condition as possible without depression of yield, to maintain high yield and power to stand up under heavy nitrogen fertilization, and to produce large full grains with low albuminous content and a minimum chaff. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 126. Dec. 1919.]—*J. P. Kelly.*

1708. Killer, J. **Über die Umzüchtung reiner Linien von Winterweizen in Sommerweizen. [Concerning the changing-over of pure lines of winter wheat into spring wheat.]** Jour. Landw. 67: 59–62. 1919.—With pure lines of winter wheat experiments were conducted to reveal spring wheat possibilities. All Bordeaux wheats serve as either summer or winter cereals. All tested thick-headed wheats with spring sowing send up shoots and show more or less development of heads but decided "Landwinterweizen" do not send up shoots with such sowing. Details of experiments are not given. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 126. Dec. 1919.]—*J. P. Kelly.*

1709. Klatt, Berthold. **Keimdrüsentransplantationen beim Schwammspinner. Ein experimenteller Beitrag zur Frage der Vererbbarkeit erworbener Eigenschaften. [Germ-cell transplantation in Lymantria. An experimental contribution to the question of inheritance of acquired characters.]** Zeitschr. indukt. Abstamm. Vererb. 22: 1–50. Dec., 1919.—A full description is given of the colors and external features of the normal gypsy-moth larva, of a yellow-spotted race supposed to be the product of a cross between *L. japonica* and *L. dispar*, and of a dorsally black-banded strain. Yellow-spotted is probably dominant to normal, but not discontinuous from it, and probably dependent upon multiple factors; black is dominant to non-black (yellow or normal), from which it is discontinuous. Gonads of recessive were transplanted into a dominant, which was mated later with a recessive to ascertain whether period of 8–9 weeks in body of the dominant would affect the offspring, endowing them with any characteristics of the dominant; *e.g.*, ovary of normal transplanted into body of black-banded female after removal of ovaries, mated with non-black, yellow ♂ gave 7♂♂, 7♀♀, "first class" yellow. In more than 400 larvæ from eggs matured in the body of a foster mother, not one showed any modification in the direction of the special characteristics of the foster parent. However, eggs that matured in the body of a female of the black race partook of the superior vigor of that race, shown by rapid growth and large size.—An average of 7–8 per cent of offspring from ♀♀ subject to operation showed loss of one or several median or lateral tubercles in one or more segments, excluding the first and last; but 3 or 4 control broods showed no such loss. Removal of certain tubercles from various segments to see if in the next year the offspring of this individual would lack the corresponding tubercles in four broods gave negative results; but in a fifth, and subsequently three other broods from mothers that had not been operated upon, a similar though less marked defect was seen. It is suggested that a general injury to determinants for the development of tubercles may have occurred, due to difficulties in metabolism during healing, or due, in case of defect in normal control broods, to bacterial disease in the brood of the previous year. There was no evidence of inheritance of mutilations. A discussion of the experiments of Harms, Magnus, Guthrie, Kammerer, and Castle and Phillips is given.—*J. H. Gerould.*

1710. Kottur, G. L. **An improved type of cotton for the southern Maratha country (Bombay Presidency, India).** Agric. Jour. India 14: 155–167. *1 pl.* 1919.—*Gossypium herbaceum* predominates in this region. This variety shows two types—erect and bushy. Test shows superiority in yield of erect type. By unit selection a variety is grown that bears more and has lint of greater value.—*Ganda Singh Cheema.*

1711. Kroon, H. M., and G. M. van der Plank. **De inschrijving van paarden in de stamboeken.** [Description of horses in the pedigree books.] Genetica 2: 347–364. July, 1920.

1712. Kuiper, K., Jr. **Steriele Soortsbastaarden.** [Sterile species hybrids.] Genetica 2: 289–299. *6 fig.* July, 1920.

1713. Lehmann, E. **Reply to Renner's explanation.** Biol. Zentralbl. 40: 288. June, 1920. [See Bot. Absts. 6, Entry 1112.]

1714. Lichtenstern, R. **Bisherige Erfolge der Hodentransplantation beim Menschen.** [Results thus far achieved by the transplantation of testes in man.] Jahreskurse f. ärztliche Fortb. April, 1920. [Cited from review by Benders, Genetica 2: 374–375, July, 1920. See also Bot. Absts. 6, Entry 1634.]

1715. Lotsy, J. P. [Dutch rev. of: Bartsch, P. **Experiments in the breeding of Cerions.** Dept. Marine Biology, Carnegie Inst. Washington Publ. 282. *55 p., 59 pl.* Washington, 1920. Genetica 2: 366–367. July, 1920.

1716. Lotsy, J. P. [Dutch rev. of: von Wettstein, Fritz. **Vererbungserscheinungen und Systematik bei Haplonten und Diplohaplonten im Pflanzenreich.** (Genetical phenomena and taxonomy in haplonts and diplohaplonts in the vegetable kingdom.) Zeitschr. indukt. Abstamm. Vererb. 21: 233–246. Nov., 1919.] Genetica 2: 379–384. July, 1920.

1717. Lundborg, H. **Hereditary transmission of genotypical deaf-mutism.** Hereditas 1: 35–40. 1920.—Acquired deaf-mutism may be both of intra- and extra-uterine origin. Consequently "congenital deafness" is not always of an inheritable nature. Acquired deaf-mutism is far more common than inheritable deaf-mutism. The treatise of Bergh is criticized. Author rejects the hypothesis of Plate that deaf-mutism is a dihybrid character. There is every probability, as the author suggested in 1912, that deaf-mutism is transmitted as a simple Mendelian factor.—*K. V. Ossian Dahlgren.*

1718. Lynch, R. Irwin. **Hybrid cestrums.** Gard. Chron. 67: 220. May 1, 1920.—Relates to hybridizing of *Cestrum elegans* (fem.) with *C. Parqui*, with view to secure brightness of flower with hardiness. Male parent stated to be almost absolutely dominant.—*J. Marion Shull.*

1719. Mandekic, V. **Nesljectivonje nikih divjstore Koet Kukuruza.** [Inheritance of several characters in maize.' [Tcheckish.] Gospodarska smotra 1918: 5–8. 1918.—Length and other ear characteristics for different lines are hereditary. Correlations of ear length with other traits were observed. Only in pure lines are traits transmitted well, and in selections from groups that are not pure lines transmission is uncertain. [From author's abstract in Zeitschr. Pflanzenzücht. 7: 40–42. June, 1919.]—*J. P. Kelly.*

1720. Mandekic, V. **Prilog gojidbi Kukuruza.** [Contributions to the breeding of maize. [Tcheckish.] Gospodarska smotra 1918: 1–4. 1918.—Croatian round maize was bred at Krizevci experimental farms following Williams's method. Experimentation on effects of self- and cross-pollination gave results similar to those of Shull and East. Lessened vigor on inbreeding is explained as due to increased homozygosity. [From author's abstract in Zeitschr. Pflanzenzücht. 7: 42–43. June, 1919.]—*J. P. Kelly.*

1721. Masui, Kiyoshi. **The spermatogenesis of domestic mammals. I. The spermatogenesis of the horse (Equus caballus).** Jour. Coll. Agric. Tokyo Imperial Univ. 3: 357–376. *3 pl., 2 fig.* 1919.—Although it is impossible accurately to count the chromosomes of the spermatogonial metaphase, many symmetrical pairs of chromosomes are distinguishable. The resting nucleus of the primary spermatocyte contains a large chromatic nucleolus which persists throughout the growth stages and synapsis. A conspicuous idiosome also exists in the primary spermatocyte. At the division of the primary spermatocyte, which is reduc-

ing and heterotypic, eighteen bivalent chromosomes and one accessory are present. Conjugation is probably parasynaptic. The accessory chromosome passes undivided to one pole, thus yielding two types of secondary spermatocytes. The division of the chromosomes, including the accessory, in secondary spermatocytes is equal and homotypic. Occasionally, incomplete fusion of two adjacent chromosomes occurs, thus reducing the count.—The centrosome behaves much as it does in man, as described by Meves. A chromatoid corpuscle appears during the growth stage, but is probably cast off from the spermatozoön in a mass of cytoplasm. Mitochondria appear during the postsynaptic stage. Most of them mass and give rise to a body resembling the "Nebenkern" in insects. Ultimately this mass comes to occupy the middle part of the spermatozoön.—*M. F. Guyer.*

1722. Masui, Kiyoshi. **The spermatogenesis of domestic mammals. II. The spermatogenesis of cattle (Bos taurus).** Jour. Coll. Agric. Tokyo Imperial Univ. 3: 377–403. *3 pl., 1 fig.* 1919.—Amitotic nuclear divisions (not followed by division of the cell-body) occur more frequently in the spermatogonia of embryos and of very young animals than do mitotic divisions. Such amitosis is regarded as characteristic of degenerating cells which are destined to supply nutriment to the germ cells. The resting nuclei of both penultimate and ultimate spermatogonia are characterized by one large nucleolus and a small chromatin mass. The spermatogonial number of chromosomes is thirty-three. Conjugation is probably telosynaptic. Sixteen bivalent and one univalent (the accessory) chromosomes result. The first spermatocytic division is reducing. The accessory passes undivided to one pole. The second division, which includes the accessory, is a simple equation-division. The chromatin nucleolus, visible through the growth period and the reduction division, is identified as the accessory chromosome.—Incomplete fusion of adjacent chromosomes sometimes occurs in the secondary spermatocytes; so that only nine or ten chromosomes can be counted in such cells. Numerous mitochondrial granules appear during the growth period and thereafter behave similarly to those of the horse. A chromatoid corpuscle is absent or present infrequently. The centrosome of the spermatid divides, and one of the resulting centrosomes comes to lie close to the nucleus—the other a short distance behind it. The axial filament arises from the latter. The idiosome first appears during the growth stage. In the spermatid it seems to have no connection with the centrosome.—*M. F. Guyer.*

1723. Meek, C. F. U. **Chromosome dimensions.** Proc. Roy. Soc. London 91: 157–165. 1920.—Correlation between chromosomes and somatic complexity of animals. Author reviews his own conclusions of 1912 and those of Farmer and Digby, 1914. He also presents additional observations, made without measurements, upon chromosome length, diameter, and total chromatin volume in spermatogonial and spermatocyte complexes of several species of widely separated groups. His final conclusions are that there is no correlation between degree of somatic complexity of animals and their chromosome number, length, or diameter, nor with the total chromatin volume of their complexes.—*C. L. Parmenter.*

1724. Metz, C. W. **Observations on the sterility of mutant hybrids in Drosophila virilis.** Proc. Nation. Acad. Sci. [U. S.] 6: 421–423. July, 1920.—Three sex-linked and probably allelomorphic mutants in *Drosophila virilis*—rugose, glazed, and wax (all affecting the eyes)—have been shown to form a graded series in respect to their morphological characteristics and in respect to fertility, the females of the last two being sterile. In any hybrid involving rugose and either of the others, the first named mutant is dominant as to somatic manifestations; but the females are sterile like the glazed or wax females. Thus the order of dominance of somatic manifestations is the one given, but the reverse is true of fertility. Previously rugose and glazed were spoken of as incompatible, but this was before the sterility of glazed females was noted.—*H. H. Plough.*

1725. Metz, Charles W. **The arrangement of genes in Drosophila virilis.** Proc. Nation. Acad. Sci. [U. S.] 6: 164–166. April, 1920.—In connection with Castle's three-dimensional model of the sex-linked genes of *Drosophila virilis* from data of Metz, certain predictions were made as to the probable location of the genes for frayed, hairy, rugose and glazed; and it was

suggested that these predictions be tested by actual breeding work. This is at present impossible since two of the stocks—frayed and hairy—have been lost, and the hybrids of rugose and glazed are sterile. Certain similar cases are cited which show that Castle's predictions would probably be fulfilled without proving the hypothesis, however; for the results also fit the linear hypothesis. In the one case double cross-overs are not counted, in the other case they are.—*H. H. Plough.*

1726. Meves, Friedrich. Eine neue Stütze für die Plastosomentheorie der Vererbung. [A new support for the plastosome theory of heredity.] Anat. Anz. 50: 551–557. *3 fig.* April, 1918.

1727. Mitscherlich, Eilh. Alfred. Über künstliche Wunderährenbildung. [The artificial production of abnormal heads of cereals.] Zeitschr. Pflanzenzücht. 7: 101–109. *8 fig.* Dec., 1919.—All rye plants grown in water culture under greenhouse conditions produced an abnormality in the first spike to appear. The remaining spikes were normal. One wheat plant behaved similarly. In a favorable year on well manured soil a rye plant was observed with condensation of spikelets on "spindle end" of all spikes. Seed from this plant gave progeny with normal spikes.—*Fred Griffee.*

1728. Moore, Carl R. The production of artificial hermaphrodites in mammals. Science 52: 179–182. Aug. 20, 1920.—A preliminary report of the author's successful transplantation of heterologous gonads into hemicastrated rats.—*H. D. Goodale.*

1729. Mossman, J. P. Hybridization and raising of seedling orchids. Florists' Exch. 49: 907, 932. April 17, 1920.—In extended account of personal experience in growing seedling orchids it is stated that *Cattleya gigas* crossed with *C. Dowiana* results in yellow veins in throat and intensified color of entire flower; with *C. aurea*, gives veining but not intensified color of sepals and petals. Used with a white flower *C. Dowiana* always puts a trace of rose color through the hybrid. *Cattleya aurea* has no influence on a white flower, but does impart its veining and some of its rich color to lip of offspring. Author uses *C. Dowiana* or *C. aurea* as seed-parent in the belief that the character of the female always predominates. Secondary crosses of *Brasso-Cattleyas* onto *Cattleya* give more color than the primary crosses. Many plants do not survive exhaustion of seed production.—*J. Marion Shull.*

1730. Nakahara, Waro. Side-to-side versus end-to-end conjugation of chromosomes in relation to crossing-over. Science 52: 82–84. July 23, 1920.—The stone-fly, *Perla immarginata* Say, is exceptionally fitted for chromosome studies since it has only five pairs of chromosomes, each pair structurally differentiated from all others. In the prophase of the first spermatocyte division, homologous chromosomes are connected to each other telosynaptically in the spireme; later they bend toward each other at the synaptic point and become reunited parasynaptically before metaphase. Contrary to the general belief, telosynapsis does offer an opportunity for interchange between chromosomes (crossing-over); interchange occurs at the late thick stage only. End-to-end conjugation simply restricts the stage in which such an opportunity is offered.—*Bertram G. Smith.*

1731. Nilsson-Ehle, H. Über Resistenz gegen Heterodera schachtii bei gewissen Gersten-Sorten, ihre Vererbungsweise und Bedeutung für die Praxis. [On resistance to Heterodera schachtii in certain varieties of barley, its method of inheritance and significance for agricultural practice.] Hereditas 1: 1–34. *4 fig.* 1920.—Unlike other kinds of cereals, there is striking difference between different sorts of barley concerning the resistance against attacks of *Heterodera schachtii.* Some sorts of barley are quite immune. By crossing between an immune sort and a susceptible one, immunity dominates. In $F_2$ nad $F_3$ a segregation takes place that at least in some cases seems to be monohybrid. For the barley itself, the attacks of this nematode are rather unimportant. If, however, oats or wheat are cultivated in a field which has been planted before with infested barley, these cereals suffer in a great degree from the increased number of nematodes in the soil. For this reason it is of a great practical importance to use mmune kinds of barley, thus reducing the number of these worms.

A field with plots of immune and susceptible kinds of barley was the following year planted with a single kind of oats. This plantation developed itself very differently at different spots, which corresponded in a surprising degree to the barley plots of the previous year.—*K. V. Ossian Dahlgren.*

1732. Nonidez, José F. **The meiotic phenomena in the spermatogenesis of Blaps, with special reference to the X-complex.** Jour. Morph. 34: 69–117. *6 pl., 2 diagrams.* June 20, 1920.—In the spermatogonial mitoses of *B. lusitanica* thirty-five chromosomes occur, three of which are remarkably large. During synapsis the three large chromosomes and two of the smaller unite to form the X-complex, while the other chromosomes pair to form fifteen bivalents. Of the large chromosomes, two that appear to be homologous are termed M-chromosomes, while the third corresponds to the accessory or X-chromosome of other forms. In the first maturation mitosis the X-complex undergoes dissociation, four chromosomes—two large and two small—passing to one cell, while the third large chromosome—an M-chromosome—enters the other. The final result is the production of two kinds of spermatozoa; one with nineteen chromosomes, the other with only sixteen. The X-complex seems to represent an intermediate condition between complexes made up exclusively of sex chromosomes and those originated by the linkage of a sex chromosome with a pair of ordinary chromosomes.—*Bertram G. Smith.*

1733. Oberstein, O. **Über das Vorkommen echter Knospenvariationen bei pommerschen und anderen Kartoffelsorten. [Occurrence of true bud-variation in Pomeranian and other varieties of potatoes.]** Kartoffelbau 1919, No. 2 and Deutsch. Landw. Presse 1919: 560–561. *1 pl.* 1919.—Author dissents from views that bud variations are so uncommon as to warrant adverse judgment on a variety when the number of deviating plants per hectare reaches four. He emphasizes frequent occurrence of bud variations, at least in some varieties. Such frequency should be proven before being accepted by seed experts. A Silesian agricultural society passes judgment against such sorts only when number of plants deviating in flower color exceeds 5 per cent. A standard of proof for existence of this variability is described. Illustrative cases observed by author in several varieties are cited. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 135. Dec., 1919.]—*J. P. Kelly.*

1734. Painter, Theophilus S. **The spermatogenesis of Anolis carolinensis.** Anat. Rec. 17: 328. Jan., 1920.—Author's abstract of paper read before the American Society of Zoologists, St. Louis, December 30, 1919.—The spermatogenesis of reptiles has not received the attention of cytologists heretofore, although the position of the group in the Vertebrate Series and especially the peculiar behavior of the chromosomes as reported for the birds and mammals, make such a study very desirable. The author has been making a comparative study of the spermatogenesis of the lizards common near Austin, Texas. *Anolis carolinensis*, the "American chameleon," has yielded preparations in which the chromosomes show with clear-cut distinctness, and it has been possible to follow practically all of the chromosomes from the spermatogonial divisions to the formation of the mature sperm.—Two points of especial interest have been found.—What appears to be a typical "accessory" or sex-chromosome is found in the first maturation division; it is bipartite in character and goes undivided to one pole of the spindle. In the second maturation division, the sex-chromosome, when present, divides. The sperms are dimorphic as regards the sex-chromosome, half are with, and half are without, this body. There is no trace of degenerating sperms.—The autosome complex of *Anolis* consists of ten large chromosomes and twenty-two smaller bodies. (This condition, a few large chromosomes and a greater number of small chromosomes, seems typical for all the lizards studied.) The autosomes behave normally during maturation. In the first and second spermatocyte divisions, five large and eleven small chromosomes are seen (in addition to the sex-chromosome), and these divide in the usual way. There is no sign of a "double reduction," such as has been reported for birds and some mammals. In this reptile, the chromosomes differ in no respect from what is found in the insects and other invertebrates.—*Theophilus S. Painter.*

1735. Philips, A. G. **Preferential mating of fowls.** Jour. Amer. Assoc. Instr. and Invest. Poultry Husb. **5**: 28, 30–32. *6 fig.* 1919.—Continuous observations were made on several flocks, each consisting of one male and 10–28 females. The number of matings per hen per day ranged from 0–5 and was controlled by her. Under some circumstances a single male mated more than 40 times in one day.—*H. D. Goodale.*

1736. Poll, Heinrich. **Mischlingsstudien VIII. Pfaumischlinge, nebst einem Beitrag zur Kern-Erbträger-Lehre.** [Hybridization studies VIII. Peafowl hybrids and a comment on the theory of nuclear bearers of heredity.] Arch. Mikros. Anat. **94**: 365–458. *5 fig.* 1920.

1737. Quaglini, Luigi. **Cruzamiento y fecundación artificial de la caña de azúcar.** [Cross fertilizing sugar cane.] Revist. Agric. Com. y Trab. **3**: 44–46. *1 fig.* 1920.

1738. Rasmuson, Hans. **Über einige genetische Versuche mit Papaver Rhoeas and Papaver laevigatum.** [Some genetical experiments with Papaver Rhoeas and Papaver laevigatum. Hereditas **1**: 107–114. 1920.—By crossing a *Rhoeas*-form having divergent hairs at the peduncle with another one having appressed hairs, a segregation in proportion 1 : 1 takes place in $F_1$. The divergent hairs might be dominant, to judge from the species hybrid *Rhoeas* × *dubium*. Yellow latex dominates over white. The segregation in $F_2$ is monohybrid. Green color of leaves dominates over yellow-green. The segregation in $F_2$ is monohybrid. A gene, *S*, produces a black base-spot on the petals; another, *W*, produces a white spot; *S* is epistatic to *W*. If both genes are missing the sepals will be unspotted. *W* affects also the flower color, or is linked with a gene that affects the color.—*K. V. Ossian Dahlgren.*

1739. Rasmusson, J. **Mendelnde Chlorophyllfaktoren bei Allium cepa.** [Mendelian chlorophyll-factors in Allium cepa.] Hereditas **1**: 128–134. 1920.—After self-fertilization of a number of flowers of different commercial sorts in several pedigrees, light green, yellow, and white plants were to be found, in relative number which rather well agreed with the Mendelian ones. This is demonstrated by several tables. The complete production of chlorophyll depends on a suite of factors, of which one factor will take effect only if all previous factors in the suite are present. At two points of the suite homomeric factors are acting.—*K. V. Ossian Dahlgren.*

1740. Raum, J. **Ein weiterer Versuch über die Vererbung der Samenfarbe bei Rotklee.** [A further study concerning inheritance of seed color in red clover.] Zeitschr. Pflanzenzücht. **7**: 149–155. 1920.—Both violet and yellow are generally found on individual seeds of red clover (*Trifolium pratense*), but occasionally seeds are either wholly violet or yellow. Colors are found in various degrees of saturation. Satisfactory Mendelian explanation would involve theory of multiple factors. Technique necessary for critical study would be very difficult because of flower size and almost invariable and necessary habit of cross-fertilization. Solution of problem is of less economic importance than many others not yet worked out in red clover. Seeds of known color were selected from individual unguarded plants and planted. Seeds from 36 daughter plants derived from 11 mother plants were compared with mother-plant seeds. Author states that daughter seeds were similar to mother-plant seeds, but had a tendency toward increased amount of yellow. Author does not believe, as some suppose, that seed color is correlated with earliness.—*L. R. Waldron.*

1741. Raum, S. **Beiträge zur Praxis der Grassamenerzeugung und des Grassamenbaues.** [Contributions to the practice of grass-seed production and grass-seed culture.] Illustr. Landwirtsch. Zeit. **1920**: 25–26. 1920.—Some results have already been secured in breeding of grasses at Weihenstephan. Two forms of fiorin grass differing in times of development were obtained. In meadow panicle, narrow- and broad-leaved forms occurred in population. A series of types was isolated in meadow foxtail grass. In red fescue-grass a form occurred well supplied with runners, and a similar thing was seen in meadow fescue. Golden oats of Bohemian and Tyrolian origin revealed few differences. In French ray-grass, only minute differences were observable, and hereditary maintenance of these was difficult. A similar

difficulty of preservation arose among forms of orchard-grass. Few differences were seen in timothy. Several types of English ray-grass were observed, but little is known of their genetical behavior. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 217. June, 1920.]—*J. P. Kelly.*

1742. Raum, S. **Zur Kenntnis des italienischen Raygrases unter besonderer Berücksichtigung seiner Züchtung.** [Italian ray-grass with special reference to its breeding.] Fühlings Landw. 1920: 28–37. 1920.—Great differences were present in this grass as regards length of life. Breeding at Weihenstephan of *Lolium italicum* comprised originally 64 individual selections; two lines were finally retained—namely, No. 36, bearded, and No. 2, rather beardless. The selected lines bloomed near each other, and after three selections there was neither pure beardedness nor pure beardlessness. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 217. June, 1920.]—*J. P. Kelly.*

1743. Renner, Otto. **Mendelsche Spaltung und chemische Gleichgewicht.** [Mendelian splitting and chemical equilibrium.] Biol. Zentralbl. 40: 268–277. June, 1920.—See also Bot Absts. 6, Entries 1099, 1713, 1744.

1744. Renner, O. **Zur Richtigstellung.** [By way of explanation.] Biol. Zentralbl. 40: 287. June, 1920. See preceding Entry 1743.

1745. Roberts, Herbert F. **The relation of protein content to variety types in American wheat.** Jour. Agric. Sci. 10: 121–134. May, 1920.—General discussion of the relation of protein content in wheat to environmental conditions and to varieties. Mostly a survey of the data from experimenters dealing with this subject. Long period between time of flowering and time of ripening seed favors production of soft kernels with low protein content. Water supply influences protein content to a greater extent than any other edaphic factor. From data submitted, it is shown that the protein content of wheat rises as we pass from moist eastern regions to the drier portions of the western states. Varietal differences do exist which manifest themselves in higher protein content when grown along with other varieties. A variety may have a higher standard deviation of protein content than others, which indicates that this variety is not pure, or that it has a wide range of physiological adaptation. The wheat varieties most widely grown are those which have the widest variability with respect to protein content. In breeding for general purposes, wheat strains should be sought which show the widest variability in protein content; but in breeding for a limited locality, wheat with a maximum protein content and with the least possible variation in protein content should be sought. A bibliography of twelve citations is attached.—*W. E. Bryan.*

1746. Robertson, W. R. B. **The presence of a longitudinal split in chromosomes prior to their union in parasynapsis.** Anat. Rec. 17: 329. Jan., 1920.—Author's abstract of paper read before the American Society of Zoologists, St. Louis, December 30, 1919.—It is usually stated in accounts of the synapsis stages that, following the telophases of the last spermatogonial division, a series of changes takes place which results eventually in the formation of fine single threads (leptotene stage) that pair in the succeeding diplotene. The chromosomes of Tettigidae, of which there are thirteen, exhibit a longitudinal split in each member during the telophase and post-telophase stages previous to parasynapsis. Following the stages in which there are thirteen split chromosomes come those in which the twelve autosomes of the group pair side by side to form six threads, each of which is probably a four-strand structure—a future tetrad. The plan of this presynapsis split in the members of a pair probably coincides to a large extent with one of the planes of division in the succeeding tetrad.—The telophases of somatic mitoses likewise show their chromosomes to be split before entering the so-called resting condition. The split in a telophase chromosome of either a somatic or spermatogonial cell-division probably dates to the resting period previous to the division just being completed.—The presynapsis splitting of each conjugating chromosome may account for the peculiar twisting sometimes visible in the two strands of one of the conjugants as compared with those of the other in long or V-shaped tetrads. The possibility of such independent twisting may have something to do with mechanics of "crossing-over."—*W. R. B. Robertson.*

1747. Roffo, A. H. **Sur le rôle du facteur race dans la transmission du cancer chez le rat. Transformation progressive d'une race non réceptive.** [On the rôle of the race factor in the transmission of cancer in the rat. Progressive transformation of a non-receptive race into a receptive one.] Compt. Rend. Soc. Biol. 83: 968–970. 1920.—Two races of white rats differ in reaction to implants of various tumors which originated in one of them (A). Tumors were of different histological types. Race A showed growths in 95–100 per cent implanted; Race B in 5 per cent; $F_1$ hybrids between these races, 15 per cent; third generation hybrids, 60 per cent. Tumor grown in Race B gave 30 per cent positive. After 9 months serial inoculation gave 80 per cent. Cross between albino and wild (*Mus decumanus*) gave albinos in $F_1$. In next generation albinos, black and white, and black. Evidence for difference in susceptibility correlated with color, was found in small numbers of animals. Tumor from hybrid generation introduced into 10 wild black rats grew slowly in one. After seven passages it grew in 70 per cent (numbers not given). Tumor had then attained virulence and rate of growth equal to control albinos.—*C. C. Little.*

1748. Rosenheim, Otto. **Observations on Anthocyanins. I. The anthocyanins of the young leaves of the grape vine.** Biochem. Jour. 14: 178–188. *Fig. 1.* 1920.

1749. Saunders, E. R. **Heredity.** Sci. Monthly 1: 436–445. 1920.—Extracts from an address at the Cardiff Meeting of the British A. A. S.—History of attempts to analyze heredity begins with Galton and Pearson.—The effect of results due to two or more factors are suspected when ratios run high.—We can not infer from the genetic analysis of one type that the factorial relations are the same for the corresponding character in another. No sharp line of distinction can be drawn between the behavior of varietal and specific features.—*L. Pace.*

1750. Schiemann, E. [German rev. of: White, O. E. **Inheritance studies in Pisum. I.** Amer. Nat. 50: 530–547. 1916. Idem. **II. The present state of knowledge of heredity and variation in peas.** Proc. Amer. Phil. Soc. 56: 487–588. 1917; Idem. **III. The inheritance of height in peas.** Mem. Torrey Bot. Club 17: 316–322. June 10, 1918; [See Bot. Absts. 1, Entry 250.] Idem. **IV. Interrelation of the genetic factors of Pisum.** Jour. Agric. Res. 11: 167–190. 1917.] Zeitschr. indukt. Asbtamm. Vererb. 24: 98–101. Aug., 1920.

1751. Schleip. [German rev. of: Herbst, K. **Beiträge zur Entwicklungsphysiologie der Färbung und Zeichnung der Tiere. 1. Der Einfluss gelber, weisser und schwarzer Umgebung auf die Zeichnung von Salamandra maculosa.** (Contribution to the physiology of development of the color and color-pattern animals. 1. The influence of yellow and black surroundings on the color pattern of Salamandra maculosa.) Abhandl. Heidelberger Akad. Wiss. Math.-Naturwiss. 1919.] Zeitschr. indukt. Abstamm. Vererb. 24: 101–103. Aug., 1920.

1752. Schubart, P. **Blutauffrischung in der Zuckerrübensamenzucht.** [Freshening the blood in sugar-beet breeding.] Zeitschr. Pflanzenzücht. 6: 209–215. Dec., 1918.

1753. Schultz, Walter. **Bemerkung zur Arbeit von Knud Sand über experimentellen Hermaphroditismus.** [Comment on the work of Knud Sand on experimental hermaphroditism.] Pflügers Arch. f. d. ges. Physiol. 179: 217–218. 1920.

1754. Scott, Will. **A sex intergrade pig, which resembles a free-martin.** Anat. Rec. 17: 323. Jan., 1920.—Author's abstract of paper read before American Society of Zoologists, St. Louis, December 30, 1919.—This pig is full term and has the external genitalia of a female. In addition, a scrotum is developed. Internally a vagina and uterus are formed, but the gonad has migrated and degenerated. The position of the ducts has been modified correlative to that of the gonad.—*Will Scott.*

1755. Siemens, Hermann Werner. **Über einige immer wiederkehrende Missverständnisse der Entwicklungslehre.** [On several always-recurring misunderstandings in genetics.] Med. Klin. 16: 12–16. 1920.

1756. Siemens. [German rev. of: Gassul, R. **Eine durch Generationen prävalierende symmetrische Fingerkontratur.** (**A symmetrical contraction of the fingers prevailing through generations.**) Deutsch. med. Wochenschr. 44: 1197–1198. *2 fig.* 1918. [See Bot. Absts. 5, Entry 367.] Idem. **Nachtrag zu meiner Mitteilung über "Eine durch Generationen prävalierende symmetrische Fingerkontratur."** (**Supplement to my contribution on a symmetrical contraction of the fingers prevailing through generations.**) Deutsch. med. Wochenschr. 44: 1450. 1918.] Zeitschr. indukt. Abstamm. Vererb. 24: 103–104. Aug., 1920.

1757. Siemens. [German rev. of: Zweig, Ludwig. **Über einen Fall von Epidermolysis bullosa hereditaria.** (**On a case of epidermolysis bullosa hereditaria.**) Arch. Dermatologie u. Syphilis 120: 1–6. 19.] Zeitschr. indukt. Abstamm. Vererb. 24: 104. Aug., 1920.

1758. Sirks, M. J. **Hereditas, genetiskt arkiv utgivet av mendelska sällskapet i Lund.** (**Hereditas, genetic archive published by the Mendelian Society of Lund.**) Vol. 1, Häft 1. Berlingska Boktryckeriet: Lund, 1920.] Genetica 2: 373. July, 1920.—Notice and review of the first number of new Swedish genetical journal, Hereditas.—*G. H. Shull.*

1759. Sirks, M. J. **Prae-Mendelistische erfelijkheidstheorieën.** [**Pre-Mendelian theories of heredity.**] Genetica 2: 323–346. *3 fig.* July, 1920.

1760. Sirks, M. J. [Dutch rev. of: Åkerman, Å. **Speltlike bud-sports in common wheat.** Hereditas 1: 116–127. *6 fig.* 1920.] Genetica 2: 365–366. July, 1920. [See Bot. Absts. 6, Entry 1565.]

1761. Sirks, M. J. [Dutch rev. of: East, Edward M., and Donald F. Jones. **Inbreeding and outbreeding.** 14 × 21 *cm.*, *285 p.*, *46 fig.* J. B. Lippincott: Philadelphia, 1919. (See Bot. Absts. 4, Entry 571; 5, Entries 337, 1495 and 1607.)] Genetica 2: 370–373. July, 1920.

1762. Sirks, M. J. [Dutch rev. of: Heribert-Nilsson, N. **Zuwachsgeschwindigkeit der pollenschläuche und gestörte Mendelzahlen bei Oenothera Lamarckiana.** (**Decline in pollen-tube growth and deranged Mendelian ratios in Oenothera Lamarckiana.**) Hereditas 1: 41–67. *1 fig.* 1920.] Genetica 2: 375–377. July, 1920.

1763. Sirks, M. J. [Dutch rev. of: Rasmuson, Hans. **Über einige genetische versuche mit Papaver Rhoeas und Papaver laevigatum.** (**Some genetical experiments with Papaver rhoeas and Papaver laevigatum.**) Hereditas 1: 107–114. 1920.] Genetics 2: 377–378. July, 1920.

1764. Sirks, M. J. [Dutch rev. of: Tedin, Hans. **The inheritance of flower colour in Pisum.** Hereditas 1: 68–97. *1 pl., 2 fig.* 1920.] Genetica 2: 378–379. July, 1920.

1765. Smith, Bertram G. **The individuality of the germ-nuclei during the cleavage of the egg of Cryptobranchus allegheniensis.** Anat. Rec. 17: 323. Jan., 1920.—Author's abstract of paper read before American Society of Zoologists, St. Louis, December 30, 1919.—In the fertilization of the egg of *Cryptobranchus allegheniensis* the germ-nuclei do not fuse, and in the first cleavage mitosis each gives rise to a separate group of chromosomes, whose descendants pass separately to the daughter-nuclei. During the ensuing resting stage each germ-nucleus is represented by a structurally distinct vesicle. The separateness of the germ-nuclei is thus maintained throughout the entire nuclear cycle. Throughout early cleavage the nuclear divisions are of the same duplex type, and the resting nuclei are always distinctly double. The genetic continuity of each half of the double nucleus has been clearly traced to an advanced cleavage stage. During late cleavage and in the early gastrula the nuclei are still typically double; but certain irregularities which tend to disguise the double structure occur with increasing frequency, and the segregation of the maternal and paternal chromatin cannot always be demonstrated. The hypothesis of individuality of the germ-nuclei as applied to those species in which there is a mingling of maternal and paternal chromosomes is discussed, and supported by considerations regarding the persistent individuality of the chromosomes. [See also Bot. Absts. 4, Entry 771.]—*Bertram G. Smith.*

1766. Stehlik, W. **Bekämpfung des Wurzelbrandes bei der Zuckerrübe durch ihre Züchtung.** [Control of sugar beet rootrot by breeding.] Öst-Ung. Zeitschr. Zuckerind. u. Landw. 47: 1–10. 1918.

1767. Steinach, Eugen, and Paul Kammerer. **Klima und Mannbarkeit.** [Climate and sexual maturity.] Anz. Akad. Wiss. Wien 56: 252–257. 1919.

1768. Steinach, E., and P. Kammerer. **Klima und Mannbarkeit.** [Climate and sexual maturity.] Archiv Entwicklungsmech. 46: 391–458. *2 fig.* 1920.

1769. Steinach, E. **Verjüngung durch experimentelle Neubelebung der alternden pubertätsdrüse.** [Rejuvenation through experimental revitalization of the senile sex glands.] Archiv Entwicklungsmech. Org. 46: 557–619. *9 pl., 7 fig.* July, 1920.

1770. Stork, Harvey, E. **Studies in the genus Taraxacum.** Bull. Torrey Bot. Club 47: 199–210. May, 1920.—*Taraxacum confertum* and *T. platycarpum* are sexual forms with a diploid chromosome number of 16. *T. vulgare*, *T. erythrospermum*, and *T. albidum* are ooapogamous forms with about twice as many chromosomes as the sexual forms. Considerable variability is found in the ooapogamous forms.—*Karl Sax.*

1771. Strasser, Hans. **Fragen der Entwicklungsmechanik. Die Vererbung erworbener Eigenschaften.** [Questions of developmental mechanics. Inheritance of acquired characters.] *158 p.* Ernst Bircher: Bern and Leipzig. 1920.

1772. Stuart, C. P. Cohen. **Die Züchtung der Teepflanze.** [Breeding of the tea plant.] Zeitschr. Pflanzenzücht. 7: 157–204. *8 fig.* June, 1920.

1773. Study, E. **Eine lamarckistische Kritik des Darwinismus.** [A Lamarckistic critique of Darwinism.] Zeitschr. indukt. Abstamm. Vererb. 24: 33–70. Aug., 1920.

1774. Švestka, Vladislav. **Eine seltene Haarbeschaffenheit (hellfarbig, stark gekräuselt) in Böhmen.** [A rare hair character (light colored, strongly crinkled).] Česká dermatol. Jg. 1: 171–174. 1920.—Describes a 12-year-old girl from region of Pilsen, studied at the clinic for skin-diseases at the Technical University at Prag. Hair of propositus was 5–6 cm. long of color No. 25 of E. Fischer's color table, and crinkled as in typical negro hair. No known negro elements occur in the ancestry, and no other negroid characters are observable in the propositus. Hair is of typical oval form in cross-section and visibly deficient in pigmentation. Eye-color is dark blue. Author raises question whether this abnormality accords with Grimaldi's theory of the introduction of negro elements to Europe at the time of the Flood. [From abstract by Matouschek in Bericht. u. d. gesamt. Physiol. 2: 22. Aug., 1920.]—*G. H. Shull.*

1775. Tayler, Noel. **A case of hermaphroditism in a lizard, Lacerta viridis.** Proc. Zool. Soc. London 1918: 223–230. *3 fig.* Mar., 1919.—The hermaphrodite possessed a complete male reproductive system and, in addition, (1) "spherical ovarian appendages" attached to the dorso-lateral border of the testes by well-defined stalks, and (2) oviducts "developed for about a third of their lengths," each having a well developed funnel. Sectioned testicular tissue was normal. Sections through the stalked outgrowths showed ovarian tissue with many large ova and smaller ova, the youngest being in the stalks near the testes. Sections through kidneys revealed in one kidney an embedded mass of almost fully grown ova. Author figures general arrangement of reproductive system; a section of ovarian tissue; and a section of kidney, showing contained mass of ova.—*A. M. Banta.*

1776. Tedin, Hans. **The inheritance of flower colour in Pisum.** Hereditas 1: 68–97. *1 colored pl., 2 fig.* 1920.—Purple color is conditioned by three factors. The presumptive factor for rose adopted from previous investigations is not a simple factor, but is composed of two factors. One of these, *A*, gives light purple, and this one is also the real fundamental

factor for the flower color in *Pisum arvense*. A second factor, *B*, together with *A*, gives rose. A third factor, *C*, acting together with *A*, gives violet, while all the three together give purple. *B* and *C* in the absence of *A* are without effect and the flowers are white. No difference has been observed between homozygotes and heterozygotes with respect to flower color. The common white-flowered varieties of peas may usually if not always be *aaBBCC*. The hilum of the violet-flowered individuals ($A\binom{A}{a}bb\ C\binom{C}{c}$) have an abnormal structure, and lack the tracheal tissue. The conduction of nourishment to the ovules is consequently made more difficult, and the plants show a very poor development of the seeds. The abnormal structure of the hilum is directly connected with the factor-combination, *AC* without *B*. Tabulations of the results of the crosses occupy 19 pages.—*K. V. Ossian Dahlgren.*

1777. Thomson, Arthur. **The maturation of the human ovum.** Jour. Anat. 53: 172–208. *3 pl., 18 fig.* April, 1919.—The diameter of the human ovum, including the zona pellucida, is about 0.11 mm. The ovum is ovoid, not spherical. The zona pellucida sometimes shows faint concentric lamination, the characteristic radial striation probably occurring only in the later stages of maturation. A distinct vitelline membrane seems to line its inner surface. At the time of the extrusion of the polar bodies, both of which are apparently expelled before the oöcyte leaves the Graafian follicle, what appears to be a perivitelline space is in evidence. —The nucleus ranged in size from 0.020 × 0.017 mm. to 0.030 × 0.024 mm.; a membrane may or may not be present. Within the nucleus are chromatin granules which may be single, paired, in masses, or arranged in threads. The karyoplasm is more finely granular and paler than the cytoplasm. The latter contains vacuoles, often with a granule within, as well as isolated granules. There is evidence of a centrosome.—*M. F. Guyer.*

1778. Urban, J. **Über die Grösse der Stecklinge.** [**On the size of cuttings.**] Zeitschr. Zuckerindust. Böhmen **42**: 521–526. 1918.—See Bot. Absts. 6, Entry 1612.

1779. van der Plank, G. M. **Kruising van Yersey met Zwartbont vee.** [**Cross of Jersey cattle with black spotted.**] Genetica **2**: 300. July, 1920.

1780. van der Wolk, P. C. **Onderzoekingen betreffedne den Cocospalm.** [**Investigations concerning the coconut palm.**] Cultura 1918: 1–34. 1918.—See Bot. Absts. 6, Entry 1613.

1781. von Rümker, K. **42 Sortenanbauversuche im Verwaltungsgebiete des Oberfehlshabers Ost.** [**Forty-two variety culture tests in Oberfehlshabers Ost.**] *72 p.* Paul Parey: Berlin, 1918.—See Bot. Absts. 6, Entry 1614.

1782. von Rümker, K. **Die Staatliche Organisation der Sortenprüfung.** [**State organization of variety testing.**] *32 p.* Paul Parey: Berlin, 1918.—See Bot. Absts. 6, Entry 1615.

1783. von Ryx, Georg. **Methoden einer exakten Prüfung des Fortschrittes bei der Zuckerrübenzucht. Paritäts- und doppelte Standard-methode.** [**Methods of exactly testing the advancement in sugar beet breeding. Parity and double standard method.**] Zeitschr. Pflanzenzücht. **7**: 227–237. June, 1920.

1784. von Ubisch, G. **Anwendung der Vererbungsgesetze auf die Kulturpflanzen.** [**Application of the laws of heredity to cultivated plants.**] Naturwissenschaften **8**: 293–300. 1920.

1785. von Wettstein, Fritz. [German rev. of: van Wisselingh, C. **Über Variabilität und Erblichkeit.** (**Variation and heredity.**) Zeitschr. indukt. Abstamm. Vererb. **22**: 65–126. *10 fig.* Jan., 1920. (See Bot. Absts. 4, Entry 3532.)] Zeitschr. Bot. **12**: 462–465. 1920.

1786. Wagner, M. **Abbauerscheinungen am Hopfen und Organisation in der Hopfenzüchtung.** [**Phenomena in unimproved hops and organization in hop-breeding.**] Deutsch. Landw. Presse 1919: 788. 1919.—After experience in a certain hop region ("Neutomischler" region) author urged an organization for hop-breeding, directed from a central office and

working locally for production of uniform stands through selection of proper plants and dissemination of cuttings of them. Author has started such selection in above-mentioned region before war. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 220. June, 1920.] —*J. P. Kelly.*

1787. Waldron, J. W., A. Gartley, C. R. Hemenway, J. N. S. Williams, G. P. Wilcox, T. H. Petrie, and H. P. Agee. **Report of the committee in charge of the Experiment Station.** Rept. Exp. Sta. Hawaiian Sugar Planters Assoc. 1919. *49 p.* 1920.—See Bot. Absts. 6, Entry 901.

1788. Winge, Ö. **Über die Vererbung der Haarfarbe der Pferde.** [**Heredity of hair color in the horse.**] Zeitschr. indukt. Abstamm. Vererb. 24: 1–32. Aug., 1920.

1789. Wodsedalek, J. E. **Studies on the cells of cattle with special reference to spermatogenesis, oögonia, and sex-determination.** Biol. Bull. 38: 290–316. *5 pl.* May, 1920.—Material for the study of the germ cells of males were obtained from the testes of seven adult bulls, one five-month fetus, and six smaller fetuses; for the cells of females, from the ovaries of four heifers and four adult cows. Somatic cells were studied in slides from various parts of a number of embryos and small fetuses of each sex.—In the male, 37 chromosomes (36 ordinary and 1 accessory) appear in spermatogonial divisions. The accessory is heart-shaped and therefore easily identified in this and succeeding divisions. It is identified with the large nucleolus of resting stages. In the primary spermatocytes, 18 bivalent chromosomes and 1 accessory appear in metaphase. The accessory passes undivided to one pole; so that half of the secondary spermatocytes receive 19, and half, 18 single chromosomes. A second doubling of chromosomes occurs; so that the equatorial plate of the secondary spermatocytes reveals 9 and 10 chromosomes (9 plus the accessory), respectively. The accessory, when present, and each of the doubled chromosomes divide. But the division is not reductional in nature; hence half of the spermatids really receive the equivalent of 18 single chromosomes, and half receive 19. Occasionally the 18 (or 19) chromosomes can be distinguished after division, but usually the chromosomes pass to the resting stage before complete separation occurs. Measurements of six hundred heads show that there are two classes of spermatozoa. Those of the larger type presumably contain the sex-chromosome.—The oögonia resemble the last spermatogonial cells closely in appearance although they are larger and possess two distinct accessory chromosomes. It is inferred that the reduced number of chromosomes in each mature ovum is 19, inasmuch as 38 appear in oögonial divisions. Male somatic cells contain 37 chromosomes, and female somatic cells, 38 chromosomes. The sex chromosomes in somatic cells—one in the male, two in the female—were as distinguishable as in the germ cells.—*M. F. Guyer.*

1790. Wohanka and Company. **28. Jahresbericht der Rübensamenzüchtungen von Wohanka & Comp.** [**28th annual report of the beet breeding of Wohanka & Co.**] *95 p., 5 fig.* Wohanka & Co.: Prag, 1918.—See Bot. Absts. 6, Entry 1624.

1791. Zade. **Die Versuche über Klee- und Gräserzüchtungen des landwirtschaftlichen Instituts Jena.** [**Experiments in clover and grass breeding of the Jena Agricultural Institute.**] ahrb. Deutsch. Landwirtsch. Ges. 1918: 139–150. 1918.—See Bot. Absts. 6, Entry 1625.

1792. Ziegler, H. E. **Zuchtwahlversuche an Ratten.** [**Selection experiments on rats.**] Festschr. z. Feier. 100-jähr. Best. Kgl. Württ. Landw. Hochschule Hohenheim. 1918: 385–399. 1918.—The author was able to modify the amount of white in the coat of Irish rats by selection. He explains his results by the multiple factor hypothesis.—*Sewall Wright.*

1793. Zweig, Ludwig. **Über einen Fall von Epidermolysis bullosa hereditaria.** [**On a case of epidermolysis bullosa hereditaria.**] Arch. Dermatologie u. Syphilus 120: 1–6. 19—.

# HORTICULTURE

J. H. Gourley, *Editor*

## FRUITS AND GENERAL HORTICULTURE

1794. Ardouin-Dumazet. **L'Horticulture des régions dévastées. (Horticulture in the devastated regions.)** Rev. Hortic. [Paris] 92: 61–63. 1920.—A brief statement is given of the general conditions which prevailed in the vicinity of the various centers of horticultural importance, together with an estimate of the damage done by war. The industry is recovering rapidly, since the local demands for the foods produced is as great as formerly, and the difficulty and expense of transportation does not permit of securing fruits or vegetables from the southern districts.—*E. J. Kraus.*

1795. Aspinwall, B. **Planting and cultivating the loganberry.** Better Fruit $14^{10}$: 12. 1920.—A brief practical account of planting and cultivating the loganberry. The author is one of the leading loganberry growers of the Northwest.—*A. E. Murneek.*

1796. Batchelor, L. B., and H. S. Reed. **Winter injury or die-back of the walnut.** Better Fruit $14^{11}$: 9–10, 32. 1920.—Reprint of California Agric. Exp. Sta. Circ. 216.

1797. Blair, R. E. **The work of the Yuma reclamation project experiment farm in 1918.** U. S. Dept. Agric. Dept. Circ. 75. *77 p., 32 fig.* 1920.—See Bot. Absts. 6, Entry 1406.

1798. Brown, W. Robertson. **Notes on the progress of the European olive at Peshawar.** Agric. Jour. India 15: 150–153. *2 fig.* 1920.

1799. Caryl, R. E. **The bearing habit of lemons.** California Citrograph 5: 294. *Fig. 1–2.* 1920.—A comparison of the bearing habits of the Eureka and Lisbon, the two chief commercial varieties of California. Graphs show comparative pickings for each month in the year at Santa Paula in the cool, moist coast district and at Corona in the hot, dry, interior district. The highest percentage of the Lisbon crop in the Corona district comes in the month of February, while in the Santa Paula district it is one month later. The proportion of midsummer pickings is greater for both varieties near the coast, though there is a greater amount of variation in the Eureka than in the Lisbon.—*J. E. Coit.*

1800. Chasset, L. **Determination des fruits (Poires). I. Considerations generales. [Classification of fruits (pears). I. Generalities.** Rev. Hortic. [Paris] 92: 106–107. 1920.—Pomological keys have proven unsatisfactory. Most of them are based upon the use to which the fruit is destined, whether for (1) the table, (2) cooking, or (3) cider. These characteristics, however, represent a final estimate of the fruit as a whole, and can not be taken as points upon which to construct keys. Nor is it sufficient to attempt classification on the basis of group names such as Doyennés, Bergamotes, Colmars, and the like, since these may contain varieties very different in character. The most satisfactory primary characters are those of shape. (To be continued.)—*E. J. Kraus.*

1801. Chasset, L. **Determination des fruits (Poires). II. La clef pomologique Chasset. [Classification of fruits (pears). II. The Chasset pomological key.]** Rev. Hortic. [Paris] 92: 126–128. *Fig. 33–48.* 1920.—A continuation of an article by the same author (Rev. Hortic. [Paris] 92: 106–107. June, 1920).—Three families are created on the basis of the relation of the height of the fruit to its breadth. These are in turn divided into groups according to the general form of the fruit; each of these forms is designated by a type variety. After a fruit has been placed in its proper family, it is next classified according to its season of maturity; then according to the color of its skin at the time of picking, not at maturity. On the basis of the length and method of insertion of the peduncle, three classes are made. Each of these classes is further divided; first, on the basis of the color of the flesh, and then on its flavor. Farther differentiation of two or more varieties not separated by the above characters is accomplished through reference to descriptive notes.—*E. J. Kraus.*

1802. Clauston, C. I. E. **The possibilities of agriculture in India within the next twenty years.** Agric. Jour. India **15**: 239–247. 1920. A discussion—*J. J. Skinner.*

1803. Dahl, A. L. **Methods of utilizing California wine grapes.** Better Fruit **14**[11]: 11–12. 1920.—Because of national prohibition and the consequent closing of wineries, wine grapes must be diverted into other channels of usefulness. A method has been perfected by which the natural flavor and aroma of the fruit may be preserved in making grape syrup. Vineyardists are working at present upon the problem of preserving the fresh juice of grapes without fermentation. Details of experiments to preserve the fresh juice by means of sulphurous acid are given. A large part of the present crop of wine grapes will be dried. Other ways of utilizing the grapes may be found in making of vinegar and saving the pomace for stock feed or for the manufacture of sugar, cream of tartar, and oil.—*A. E. Murneek.*

1804. Darrow, G. M. **Raspberry culture—red, black, purple. In all phases.** Better Fruit **14**[11]: 3–4, 35–38. 1920.—A verbatim reprint from U. S. Dept. Agric. Farmer's Bull. 887. —*A. E. Murneek.*

1805. Darrow, G. M. **The currant and gooseberry and how to grow them.** Better Fruit **14**[9]: 8–10, 38. 1920.—A verbatim extract from U. S. Dept. Agric. Farmer's Bull. 1024.

1806. Enfer, V. **Stérilité des arbres fruitiers.** [Sterility of fruit trees.] Rev. Hortic. [Paris] **92**: 46. 1920.—Sterility may be due to an abundance of fertilizers which induce excessive vegetative growth; fungous diseases, such as *Fusicladium pyrinum*; insects, such as aphids and beetles; late spring frosts; rains, which wash away the pollen and prevent the activity of bees; heavy winds; and excessive blooming or production of fruits. All these factors should be considered, and such measures as may seem practical utilized in combating them.—*E. J. Kraus.*

1807. Enfer, V. **Sur la Passe-Crassane.** [Concerning the Passe-Crassane pear.] Rev. Hortic. [Paris] **92**: 88–89. 1920.—This excellent variety should be planted more widely. Though the fruit tends to be rough on very rapidly growing trees, when the variety is grafted on the quince the fruits are large, smooth and of good quality. It forms especially congenial union with Beurré Diel, Curé, and Beurré d'Hardenpont. Special care is required in pruning. —*E. J. Kraus.*

1808. Enfer, V. **Treilles gelées.** [Frozen grape-vines.] Rev. Hortic. [Paris] **92**: 67–68. 1920.—When vines are frozen, due to late frosts following a period of weather which has advanced the season's growth, not only may the crop of that season be ruined, but that of the following year may be endangered. The eye or bud of the grape possesses at its base another bud, or sometimes two, which may be forced into growth if the principal one is destroyed. The shoots arising from these second buds, when proper care is taken, will develop into strong canes, and will frequently produce bunches of fruits. In the event of a freeze, all of the frozen buds should be cut away immediately, both to encourage the production of new shoots from the second buds, and to prevent the decomposition of the frozen tissues near such buds. Later the unfruitful or weaker shoots should be removed entirely, and those which remain should be pinched back before the end of the growing season in order to encourage maturation and lignification.—*E. J. Kraus.*

1809. Etter, Albert E. **The origin of the Ettersburg strawberry.** Better Fruit **14**[6]: 14. Dec., 1919.—The "Peruvian Beach" strawberry was pollinated with a blossom from one of the third generation Sharpless × Parry plants. Among the eleven seedlings growing from seed of this cross was the Ettersburg.—*A. E. Murneek.*

1810. Flahault, C. **L'Horticulture en Alsace.** [Horticulture in Alsace.] Rev. Hortic. [Paris] **92**: 26–28. 1920.—The alluvial soil of Alsace, and the general climatic conditions, are well adapted to the growing of plants of many kinds, both native and exotic. This has resulted in the development of a large nursery industry and of a broad, general amateur and

professional interest. Formerly many professional gardeners were trained here. A plea is made for the establishment at Strasbourg of a definitely organized institution for training native gardeners, particularly those capable of speaking French and the Alsatian dialect.—*E. J. Kraus.*

1811. Flippance, F. **Betel.** Gardens' Bull. Straits Settlements **2**: 294–300. *3 pl.* 1920.—A description of the Betel nut palm (*Areca Catechu*, Linn.) and the Betel Leaf (*Piper Betle*, Linn.) with notes on their uses and extent of cultivation in Malaya.—*T. F. Chipp.*

1812. Garnier, M. **Plantes nouvelles ou peu connues. (New or little-known plants.)** Rev. Hortic. [Paris] **92**: 55–56. *Fig. 13–14.* 1920.—Brief descriptions of nine varieties of vegetables, including the bean, beet, cabbage, tomato, melon, peas and cardoon, and eight varieties of flowers, such as *Cyclamen, Myosotis*, carnation, *Petunia, Begonia, Verbena*, and China aster, are given.—*E. J. Kraus.*

1813. Gould, H. P. **Some useful and timely hints on peach growing.** Better Fruit **14**[11]: 8–9. 1920.—A verbatim reprint from U. S. Dept. Agric. Farmers Bull. 632.

1814. Guion, A. **Chauffage de serres par l'électricité. [Heating greenhouses by electricity.]** Rev. Hortic. [Paris] **92**: 64. 1920.—It is feasible to use electricity for this purpose only when it can be obtained cheaply. Heating may be effected by the use of radiators, of which there are many forms available, or by tubes beneath the benches and connected with an electrically heated supply tank or boiler. One of these devices could be installed in each house or group of houses. It would be possible to heat them by means of wood or charcoal-burning stoves in case the current should fail temporarily.—*E. J. Kraus.*

1815. Hammond, A. A. **Small fruit culture in Victoria.** Jour. Dept. Agric. Victoria **18**: 351–358. *4 pl.* 1920.—A description of the cultivation of the loganberry and of conditions suitable for its growth is given.—*J. J. Skinner.*

1816. Hansen, Dan. **The work of the Huntley reclamation project experiment farm in 1918.** U. S. Dept. Agric. Dept. Circ. 86. *32 p., 5 fig.* 1920.—See Bot. Absts. 6, Entry 1413.

1817. Headley, F. B. **The work in 1918 of the Newlands (formerly the Truckee-Carson) reclamation project experiment farm.** U. S. Dept. Agric. Dept. Circ. 80. *18 p., 1 fig.* 1920.—See Bot. Absts. 6, Entry 1417.

1818. Hess, N. **Experiences in plant hybridization.** Proc. Amer. Soc. Hortic. Sci. **16**: 52–60. (1919) 1920.—Attention is drawn to the fact that of all the fields pertaining to evolution, the one that seems to be the least cultivated is hybridism. Few artificially produced hybrids are referred to in citing examples, but most of them are natural hybrids.—Hybridism has been employed more especially in floriculture, and this has been for the purpose of obtaining monstrous novelties. Many of the most popular ornamental flowers are due to hybridization.—The author has been carrying on rather extensive experiments in hybridization with two genera; namely, *Rubus* and *Quercus*. Detailed results, obtained from crossing blackberries and dewberries are given. Data are presented on third generation results in crossing, in several cases.—The results of several years' work in crossing different oaks (*Quercus*) are given. From the work with oaks the author states that he has learned that the various individuals of a species vary widely in their affinity for foreign pollen. He has come to believe that to be successful in hybridization, it is necessary to search out by trial the individuals having the proper affinity for the pollen to be applied. For this purpose, seedlings would naturally be preferred to plants produced vegetatively.—*E. C. Auchter.*

1819. Howard, W. L. **Fruit growing and dairying: A desirable farming combination.** Proc. Soc. Promotion Agric. Sci. **39**: 135–139. 1919.—Fruit growing in California has become highly specialized. Whole districts devoted almost exclusively to the production of one kind of fruit for 35 or 40 years are finding the soil is becoming unfertile for want of humus.

The growing of winter green manure crops has not entirely overcome this difficulty. Better success has been achieved by growing field beans in the orchard or a strip of alfalfa between the rows. The author proposes a combination fruit and dairy farm as the best means of maintaining the soil fertility in California orchards. This farm should preferably be operated by two men—one a fruit grower and one a dairyman. This plan besides furnishing manure for the orchard would better distribute the labor.—*H. N. Vinall.*

1820. Howard, W. L. **The value of the different roots as stock.** Better Fruit $14^{10}$: 19–20. 1920.—A brief discussion is given of the value of apricot root stock for prunes and the French and Japanese root stocks for pears.—*A. E. Murneek.*

1821. Jouin, E. **L'Horticulture in Lorraine désannexée.** [**Horticulture in disannexed Lorraine.**] Rev. Hortic. [Paris] 92: 44–45. 1920.—Previous to 1870 a broad professional and amateur interest was manifested in horticulture. This has declined appreciably since then, though recently there seems to be a new and awakened interest. There is but one important public garden, located at Metz. The hills on the left shore of the Moselle, the Saar basin and the Palatinate afford a considerable tree and small fruit industry. There are many small greenhouses which do a local business in easily grown plants. There is an extensive vegetable growing industry at Metz, and on both banks of the Moselle. The nursery business has always been the most extensive branch of horticulture in Lorraine. At various places good specimens of various exotic trees may be found.—*E. J. Kraus.*

1822. Judd, C. S. **The Makiki Nursery.** Hawaiian Forester and Agric. 17: 124–126. 1920.

1823. Kraemer, Henry. **Michigan—an important source of raw vegetable products.** Michigan Acad. Sci. Ann. Rept. 21: 167–199. 1919.—See Bot. Absts. 6, Entry 1980.

1824. Lamproy, E. **Le rajeunissement des pêchers en plein vent.** [**Rejuvenation of standard peach trees.**] Rev. Hortic. [Paris] 92: 32–34. *Figs. 7–8.* 1920—The method of rejuvenation consists in a heavy heading-back, even of the very large branches, close to a lateral; so that the process is at the same time also one of thinning out. Larger yields of better fruit were secured from the pruned trees than from those which were left unpruned and had been neglected for some time. The cuts should be made with a fine-toothed saw, trimmed with a sharp knife, and covered with mastic. Attention is directed to the fact that this same method of pruning peach trees was advocated in the middle of the nineteenth century by Naudin et Decaisne in their "Manuel de l'amateur des jardins" 4: 423.—*E. J. Kraus.*

1825. Landry, R. **Le transport des primeurs par avion.** [**Transporting early crops by aeroplane.**] Rev. Hortic. [Paris] 92: 83. *Fig. 20.* 1920.—A shipment of forced strawberries of the variety Doctor Morére was sent by aeroplane on March 18, 1920, by Mr. de la Celle, from Saint-Laurent-du-Var to Paris.—*E. J. Kraus.*

1826. Letteer, C. R. **The work of the San Antonio experiment farm in 1918.** U. S. Dept. Agric. Dept. Circ. 73. *38 p., 4 fig.* 1920.—See Bot. Absts. 6, Entry 1423.

1827. Lewis, C. I. **Pear culture at home and abroad.** Better Fruit $14^{10}$: 23–24. 1920.—A popular article on pear growing, with particular reference to the northwestern United States.—*A. E. Murneek.*

1828. Noren, C. A. **A practical demonstration of fruit thinning.** Better Fruit $14^{12}$: 15–16. 1920.—Four sets of comparisons were made of well thinned and poorly thinned orchards. In every case fruit from poorly thinned orchards was smaller in size and lacked the necessary color to grade it as "extra fancy." The writer believes also that proper thinning lessens the strain on fruiting spurs and diminishes the habit of alternate bearing.—*A. E. Murneek.*

1829. Parmentier, Paul. **Les irrigations et les arrosages en Syrie et en Palestine.** [Irrigation in Syria and Palestine.] Compt. Rend. Acad. Sci. Paris **169**: 391–393. 1919.—A discussion of the climate and the methods of irrigation of various crops in Syria and Palestine. The methods of irrigation employed are inefficient because of the excessive amount of water required; the high humidity produced in groves of fruit trees, which greatly increases the growth of parasitic fungi; and the effect of the fungi on the quality of vegetables.—*V. H. Young.*

1830. Ruffer, Sir Arnold. **Food in Egypt.** Mem. Inst. Egypt. 1. *86 p.* 1919.

1831. Russell, G. A. **A machine for trimming camphor trees.** U. S. Dept. Agric. Dept. Circ. 78. *8 p., 4 fig.* 1920.—See Bot. Absts. 6, Entry 1468.

1832. Sundquist, R. **Means of accomplishing orchard tillage.** Better Fruit $14^{12}$: 25–26. 1920.—In respect to clean tillage of orchards in irrigated sections three essentials are emphasized: (1) the soil must be worked early in the spring; (2) it must be left in a pulverized condition; and (3) tillage must be continued throughout the early part of summer. The value of the tractor for tillage purposes is discussed in detail.—*A. E. Murneek.*

1833. Taylor, R. H. **The growing and culture of almonds in California.** Better Fruit $14^{10}$: 3–6, 40. 1920.—An extract from "The Almond in California." California Agric. Exp. Sta. Bull. 297. 1918.

1834. Thornber, W. S. **Commercial fertilizers for the orchard and the garden.** Better Fruit $14^{9}$: 7, 39. 1920.—The writer discusses in a general way the necessity and value of the use of commercial, particularly nitrogenous, fertilizers in the orchards of the northwestern United States. The present economic necessity of increasing crops is emphasized.—*A. E. Murneek.*

1835. True, Rodney H. [Rev. of: Hedrick, U. P. **Manual of American grape-growing.** MacMillan Co.: New York, 1919.] Bot. Gaz. **68**: 390–391. 1919.

1836. West, F. L., and N. E. Edlefsen. **Temperature which will damage or kill fruit buds.** Better Fruit $14^{10}$: 13–14. 1920.—An almost verbatim extract Utah Agric. Exp. Sta. Bull. 151. 1917.

1837. Zimmerman, G. **Planting and care of prune orchard up to bearing age.** Better Fruit $14^{11}$: 5, 33–34. 1920.—Based on long practical experience advice is given by a successful prune grower as to the selection of site, planting, and cultural management of a prune orchard up to bearing age of the trees.—*A. E. Murneek.*

## FLORICULTURE AND ORNAMENTAL HORTICULTURE

1838. Anonymous. **Groupement des meilleures variétés de chrysanthèmes.** [Grouping of the best varieties of chrysanthemums.] Jour. Soc. Nation. Hortic. France **21**: 39–51. Jan., 1920.—This is a grouping of varieties of chrysanthemums by a committee of French horticulturists, giving lists of the best varieties of the different types for various purposes and uses. —*H. C. Thompson.*

1839. Anonymous. **The fruiting of the Ginkgo at Kew.** Kew Bull. Misc. Inf. [London] **1920**: 47–48. *1 fig.* 1920.—First record of the fruiting of Ginkgo in England.—*E. Mead Wilcox.*

1840. Anonymous. **Concours de roses nouvelles de Bagatelle 1920.** (Concours of new roses at Bagatelle 1920.) Rev. Hortic. [Paris] **92**: 125–126. 1920.—A gold medal was awarded to Pernet-Ducher for the new, vigorous, floriferous, pure chrome-yellow variety Souvenir de Claudius Pernet, and to A. Dickson for the new hybrid tea, Frances Gaunt, which is free

flowering, semidouble, and of a salmon-yellow color. Certificates were granted for the following varieties: Benedicte Seguin (Pernet-Ducher)—resembling a hybrid-tea rather than Pernetiana, golden yellow; Président Parmentier (Sauvageot)—hybrid-tea, apricot rose, seedling of Colonel Leclerc × Le Progrès; La France Victorieuse (Hay Rosery)—hybrid-tea, tender rose, deeper at center; Comtesse de Cassagne (Guillot)—hybrid-tea, ivory yellow, tinged salmon at center; Mermaid (Wm. Paul)—hybrid of *Rosa braceata* and an unknown variety of tea, single, pale yellow, foliage brilliant and persistent in winter, valuable as a source of new varieties. Several other varieties of interest are listed.—*E. J. Kraus.*

1841. Anonymous. **List of seeds of hardy herbaceous plants and of trees and shrubs.** Kew Bull. Misc. Inf. [London] Appendix 1920: 1–25. 1920.

1842. Anonymous. **A garden flora: Nymans.** Kew Bull. Misc. Inf. [London] 1919: 240. *10 figs.* 1919.—A list of plants grown in the Messel collection at Nymans in the south of England with notes on the behaviour of the more remarkable species.—*E. Mead Wilcox.*

1843. Bean, W. J. **Garden notes on new or rare trees and shrubs.** Kew Bull. Misc. Inf. [London] 1920: 119–124. 1920.

1844. Blin, H. **Sur la résistance du vitrage des serres.** [**The resistance of green house glass.**] Rev. Hortic. [Paris] 92: 113–114. 1920.—Brief comparative table is given on the relative breaking strength of two types of glass, together with another table showing the relation between weight and thickness of glasses having unit surface area.—*E. J. Kraus.*

1845. Bois, D. **Le laeliocattleya Firmini.** Rev. Hortic. [Paris] 92: 30. *1 pl. (colored).* 1920. —This species is named for Firmin Lambeau, of Brussels, and was produced by A. A. Peeters & Sons, from a cross made in 1904 between *Laeliocattleya Ceres* (*Cattleya Mossiae* × *Laeliocattleya Phoeba*), a yellow variety, and *Cattleya Dowiana aurea.* Two forms differing in color from the original are also known. *L. Firmini ardens,* shown at London in 1913, has the floral divisions, copper red instead of apricot yellow, whereas *L. Firmini Massange,* named for Leon Massange by Peeters in 1913, is reddish saffron. The several varieties are the same in form of flower and in character of the lip.—*E. J. Kraus.*

1846. Chenault, L. **Hamamelis vernalis Sargent.** Rev. Hortic. [Paris] 92: 47. *Fig. 11.* 1920.—A brief description of this species from the viewpoint of using it as an ornamental is given. It is recommended because of its hardiness and the abundance of fragrant blossoms it produces very early in the spring. It might even be utilized as a pot-plant for house decoration, provided some leafy plant were grown with it to produce the foliage effect.—*E. J. Kraus.*

1847. Clarkson, Edward Hale. **The story of a fern garden. I.**—Amer. Fern. Jour. 10: 53–57. 1920.

1848. Eldridge, A. G. **Plants for gardens farthest north.** Garden Mag. 31: 245–248. *4 fig.* 1920.—Discusses herbaceous woody and ornamental plants for various environments in the northern United States and Canada.—*H. C. Thompson.*

1849. Garnier, M. **Plantes nouvelles pour 1920.** [**New plants for 1920.**] Rev. Hortic. [Paris] 92: 34–35. *Fig. 9–10.* 1920.—Brief descriptive notes are given on thirteen herbaceous ornamentals and pot-plants of wide variety, an early turnip, an early pea, and a hardy, productive potato.—*E. J. Kraus.*

1850. Guillaumin, A. **Le Colocasia. À propos de l'introduction récent du vrai C. indica.** [**Concerning the recent introduction of the true Colocasia indica.**] Rev. Hortic. [Paris] 92: 104–106. *Fig. 26–27.* 1920.—A short descriptive note of this species, to which many names have been given, its means of separation from the closely allied forms, and a short key to the several species of the genus, are given.—*E. J. Kraus.*

1851. Krelage, E. **À propos de la classification des Tulipes. [Concerning the classification of tulips.]** Rev. Hortic. [Paris] 92: 30–31. 1920.—Corrections of an article by Mottet, S. (Les tulipes Darwin. Rev. Hortic. [Paris] 92: 10–11. Jan., 1920.) Figure 4 of the colored plate does not represent the variety Goldflake, which is red striped with yellow, but rather some variety belonging to the class known as "bizarres." Instead of representing several varieties of Darwin tulips, as the legend indicates, the plate actually shows clearly the differences between the Darwins and other late tulips. The varieties Rev. Ewbank and Europe, with flowers more or less square and enlarged at the base are typical of the Darwins, to which Margaret also belongs, but it is not so well figured. Inglescombe Yellow, with elongated flower, belongs to the Cottage class. The yellow color is never found among Darwin tulips. A report based upon a study in 1914 and 1915 of varieties grown under more than 1500 names in the gardens of the Royal Horticultural Society of London was issued in 1917. It is the work of a joint committee from England and Holland, and contains many illustrations as well as a system of classification of the various varieties.—*E. J. Kraus.*

1852. Lesourd, F. **Campanula pyraversi Cayeux.** Rev. Hortic. [Paris] 92: 124. *1 plate (colored), fig. 32.* 1920.—This form was obtained by Mr. F. Cayeux as a hybrid between *Campanula pyramidalis* L. and *C. versicolor* Sibth and Smith, whence the name. It is self-fertile, and likewise fertile with either of the parent species. The hybrid possesses characters derived from both parents, but in the long petioles of the radicle leaves and the well developed pedicels of the flowers it resembles neither. Because of its desirable tints of blue color, darker at the center, long blooming season, and adaptability for growing in beds, in masses, or in pots, it should be generally cultivated.—*E. J. Kraus.*

1853. Lesourd, F. **Contribution a l'histoire de la pyramide. [On the history of the pyramidal tree.]** Rev. Hortic. [Paris] 92: 81–82. 1920.—Though incapable of exact determination, it appears that the pyramidal type of tree originated in Lorraine, near Metz, at an early date and spread from there eastward and westward, reaching the region of Paris about the middle of the eighteenth century or a little later. Several direct literature citations are given.—*E. J. Kraus.*

1854. Letacq, A. **Notes sur la culture du Camellia dans l'ouest de la France. [On the culture of Camellia in western France.]** Rev. Hortic. [Paris] 92: 120–121. 1920.—It is possible to grow *Camellia japonica* L. throughout an extensive territory in France. The plants must be protected in the more northern ranges, but are perfectly hardy in the south. It is especially to be noted that silicious soils are the most favorable to good development, whereas in calcareous soil the plants soon turn yellow and die.—*E. J. Kraus.*

1855. Lillie, R. I. **Flowers.** Hawaiian Forester and Agric. 17: 6–9. 1920.—Discusses factors involved in successful flower growing, grouping them under four heads: (1) seasons; (2) seeds; (3) sowing; and (4) soil. Practical for amateurs.—*Stanley Coulter.*

1856. Loizeau, A. **Jardin en campagne. [A country garden.]** Rev. Hortic. [Paris] 92: 51–53. *Fig. 12.* 1920.—The discussion deals with the general arrangement of country gardens, and the location of specimen plants, groupings, and borders. A selected list of materials and proposed plan are submitted.—*E. J. Kraus.*

1857. Morel, F. **Les bénéfices d'une calamité: Laurier de Serbie et Pyracantha pauciflora. [The good fortunes out of a calamity. Serbian laurel and Pyrocantha pauciflora.]** Rev. Hortic. [Paris] 92: 80–81. 1920.—The Serbian laurel, *Laurocerasus schipkaensis*, proved entirely hardy during the severe winter of 1917. A number of the hybrid seedlings of this species and the Caucasian laurel also proved perfectly hardy. These forms were very variable in character, some of them being worthy of propagation. *Pyracantha pauciflora*, while entirely hardy, normally produces few flowers or fruits and is, to that extent, lacking in decorative qualities. A number of seedlings of it, however, have not only proven perfectly hardy, but also highly productive of both flowers and fruits. These should prove of great value as ornamentals.—*E. J. Kraus.*

1858. Morel, F. **Les bénéfices d'une calamité—Buxus haleppica, Evodia, Actinidia chinensis.** [The good fortunes out of a calamity, Buxus haleppica, Evodia, Actinidia chinensis] Rev. Hortic. [Paris] 92: 100–102. 1920.—A continuation of a similar article by the same author in Rev. Hortic. [Paris] 92: 80–81. May, 1920.—Among a number of seedlings of a box-plant presumed to be *Buxus haleppica*, all of which possessed broad leaves, larger than those of any of the varieties of the common box, one at least has proven entirely hardy. This is a desirable ornamental and may furnish valuable genetic material. Specimens of *Evodia*, large, rapidly growing Asiatic trees with ash-like foliage and semi-tropical appearance, and also those of *Actinidia chinensis*, an ornamental vine, were uninjured by the severe cold weather of 1917.—*E. J. Kraus.*

1859. Mottet, S. **Cedrus libani brevifolia.** Rev. Hortic. [Paris] 92: 84–86. *Fig. 21.* 1920.—During the past two centuries of cultivation, *Cedrus libani* has given rise to the following varieties: *glauca, nana, nana pyramidata, pendula, denudata, stricta, candelabrum, fusiformis, microcarpa,* and *decidua.* The variety *brevifolia* was discovered in 1879, on the Island of Cyprus. It is a distinct form, readily distinguished by the short, deep green leaves. It grows more slowly and gracefully than the type species, and deserved to be widely planted, especially in parks and gardens where space is limited.—*E, J. Kraus.*

1860. Mottet, S. **Le lilium regale en Amerique.** [Lilium regale in America.] Rev. Hortic. [Paris] 92: 66–67. *1 pl.* 1920.—This fine representative of the longiflorum group has proven entirely hardy in Massachusetts. It is readily propagated from seeds and adapted to forcing as well as out-door culture. It was introduced by E. H. Wilson from the valley of the Min, in the north-west of Setchuen, China. A hybrid between *Lilium regale* and *Lilium sulfureum*, itself belonging to the longiflorum group and having large, long flowers of a beautiful canary color, is said to be taller than the former, bulbiliferous like the latter, and productive of large, odorous flowers.—*E. J. Kraus.*

1861. Mottet, S. **Nouveaux Narcisses grandiflores.** [New large flowered Narcissi.] Rev. Hortic. [Paris] 92: 47–49. *1 pl. (colored).* 1920.—Several of the newer varieties are considered worthy of special mention. These include the following: *Narcissus Pseudo-Narcissus* —Glory of Leiden, Madame de Graaf; *N. incomparabilis*—Barri Albatros, Vesuvius, Magdaline de Graaf, Princess Mary, Beatrice Leedsi; *N. poeticus,*—Virgile. The colored plate illustrates Weardale Perfection, Cleopatra, Will Scarlet, Gloria Mundi, White Lady, and Mrs. Langtry.—*E. J. Kraus.*

1862. Petit, A. **Arrosage par immersion des plantes en pots.** [Watering pot plants by immersion.] Rev. Hortic. [Paris] 92: 68. 1920.—The watering of potted plants by immersing the pots in a tank has the advantages of complete wetting without displacing any of the soil, of conserving the soil nitrates, and of a great saving of time and hand labor. The pots should not stand more than half their depth in water. As soon as the soil has become thoroughly moistened the tanks should be drained. For the greatest success, it is essential that all such conditions as age, size and type of plant, kind and amount of soil, as well as form and dimension of the pots should be uniform. Since this is difficult to secure, it is necessary frequently to regroup the plants in the several tanks.—*E. J. Kraus.*

1863. Pinelle, J. **Berberis subcaulialata C. K. Schneider.** Rev. Hortic. [Paris] 92: 28–30. *Fig. 5–6.* 1920.—This species was found by Maurice de Vilmorin arising from some seeds coming from Thibet, in 1904. It is thoroughly hardy and adapted to a wide variety of soils. The foliage is persistent up to December or January. The fruit is red. It is suited for planting in large masses. Propagation may be effected either vegetatively or by sowing stratified seeds in March or April.—*E. J. Kraus.*

1864. Pinelle, J. **Lonicera Maacki Ruprecht.** Rev. Hortic. [Paris] 92: 122–123. *Fig. 30–31.* 1920.—This shrubby species has long been known and cultivated in the botanic garden at Moscow. The flowers are conspicuous, produced abundantly, white changing to yellow, followed by red fruits which are ornamental in the autumn. It is entirely hardy and deserving of being widely planted.—*E. J. Kraus.*

1865. Pinelle, J. **Pterocarya stenoptera.** Rev. Hortic. [Paris] 92: 91–92. *Fig. 22.* 1920.—This thoroughly hardy species is vigorous, indifferent as to soil, and deserves to be more generally planted. It has proven entirely satisfactory as a street tree in Paris. Propagation is most readily effected by seeds, though shoots are produced freely fron the root; cuttings are also employed.—*E. J. Kraus.*

1866. Poupion, J. **Les Catasetum, leur culture. [Growing Catasetums.]** Rev. Hortic. [Paris] 92: 98–100. *Fig. 23–25.* 1920.—Species and varieties of this genus are not generally seen in the collection of either commercial or amateur orchid growers. Usually the plants degenerate and die soon after importation or at least flower but rarely. This condition can be corrected through cultural methods. The plants should have complete rest without watering from November to March, in a cool house. They may then be completely potted anew, brought into a temperature of about 18° to 23°C., and watered sparingly after growth begins by dipping the pots into water the temperature of the greenhouse. When the flowers appear in April or May, the watering must be further decreased, and special care exercised to prevent either the direct rays of the sun or drafts of air from striking the new growths which reach maturity about November, at which time the rest period begins. This method of treatment has been employed with entire success with eleven species and varieties of this genus.—*E. J. Kraus.*

1867. Poupion, J. **L'Inobulbon munificum Kranzlin.** Rev. Hortic. [Paris] 92: 64–66. *Fig. 15–16.* 1920.—The separation of *Dendrobium muricatum* Finet and *D. muricatum munificum* Finet on the basis that the former produces a single flower cluster while the latter produces several is untenable, since both in culture and in the native state the same plant may produce single or multiple clusters, depending upon its vigor. Kranzlin considered this form generically distinct from *Dendrobium*, and made two species on the basis of the single or multiple character of the flower cluster; the former he called *Inobulbon muricatum*, the latter *Inobulbon munificum*. These two species are one and the same. A detailed description is given. The species requires a warm house throughout the year, and offers interesting material for hybridization.—*E. J. Kraus.*

1868. Proschowsky, A. R. **L'Aralia à papier sur la Côte d'Azur. [The paper Aralia at Côte d'Azur.]** Rev. Hortic. [Paris] 92: 103. 1920.—*Tetrapanax papyrifer* C. Koch has proven an excellent, partially hardy ornamental. Though it flowers profusely, no fertile seeds are produced. It propagates itself very readily, however, by means of sprouts from the roots, to the extent that frequently a group of mass effect is produced about a single mother plant. The pith is said to be used in China and Japan for the manufacture of a superior grade of paper.—*E. J. Kraus.*

1869. Proschowsky, A. R. **Les Conifères dans les terres calcaires sur la Côte-d'Azur. [Conifers in calcareous soils at Côte-d'Azur.]** Rev. Hortic. [Paris] 92: 75. 1920.—In addition to the Aleppo pine, which is found abundantly as a native in the district mentioned, the four conifers most resistant to calcareous soils are *Pinus excelsa* Wall; *Pinus canariensis* C. Sm; *Pinus Laricio* Poir; and *Pinus radiata* D. Don. Among the other resistant conifers the following are mentioned: *Picea Morinda* Link; *Cedrus Deodara* Loud; *Cupressus sempervirens* L; *Cupressus lusitanica* Mill; *Cupressus guadalapensis* S. Wals; *Cupressus macrocarpa* Hartw; *Cryptomeria japonica* Don.; *Araucaria excelsa* R. Br.; *Araucaria Bidwilli* Hook; *Thuyopsis dolabrata* Sieb. and Zucc; species of *Podocarpus, Cephalotaxus* and *Juniperus*, and others.—*E. J. Kraus.*

1870. Ridsdale, P. S. **The Memorial Trees of the United States.** Garden Mag. 30: 177–180. *2 fig.* 1920.—A discussion of the movement on foot all over the country to plant trees as memorials, giving methods of planting and caring for different kinds of trees.—*H. C. Thompson.*

1871. Turbat, E. **Les belles roses nouvelles ou récentes. [Good roses, new or recent.]** Rev. Hortic. [Paris] 92: 31–32. 1920.—The present article deals with varieties of special merit belonging to the class Pernetiana, created by Pernet-Ducher, which have been introduced since 1910. *Constance* (Pernet-Ducher), 1915—good for massing, but elongated, orange yellow, striped carmine; flower cadmium yellow passing to golden yellow; more hardy than *Rayon d'Or* (Pernet-Ducher) 1913. Juliet (W. Paul) 1910,—extremely vigorous; flower full, perfumed, rich rose red deepening on opening, reverse of petals old gold; much in demand as a cut flower. Louise-Catherine Breslau (Pernet-Ducher), 1912—vigorous, flower large, full, shrimp red tinted copper red orange, reverse of petals chrome yellow; good for massing or for cutting. Madame Edouard Herriot, (Pernet-Ducher), 1913—very floriferous, coral red shaded yellow and saffron red, passing to shrimp red; incomparable for massing and excellent for cutting. Marie-Adelaide Grande Duchesse de Luxembourg (Soupert and Notting), 1912—flower large, full, deep orange, bud elongated, good for massing or cutting. Mistress Wemyss Quin (A. Dickson and Sons), 1914—flower medium, intense chrome yellow; excellent for massing. Expression of judgment is reserved on the following varieties: *President Bouche, Raymond, Mrs. Farmer, Severine* (Pernet-Ducher), and *Golden Emblem* (MacGredy). (To be continued.)—*E. J. Kraus.*

1872. Turbat, E. **Les belles roses du groupe hybrides de thés distribuées depuis 1910. [Good hybrid-tea roses distributed since 1910.]** Rev. Hortic. [Paris] 92: 49–50. 1920.—A continuation of a similar article (Rev. Hortic. [Paris] 92: 31–32. 1920.).—The following varieties are included and briefly described: Admiral Ward (Pernet-Ducher), 1915—good grower, very floriferous, large full flower, carmine shading to flame red and velvety purple, for massing and cutting. André Messimy (P. Guillot), 1914—medium grower, floriferous, brilliant ochreous orange, shaded carmine. Augustus Hartmann (B. R. Cant), 1914—good grower, floriferous, very large flowers, geranium red shaded orange. Colette Martinet (Pernet-Ducher), 1915—extremely floriferous, flowers full, old gold shaded yellow orange, for massing and cutting. Duchess of Normandy (Ph. Le Cornu), 1912—delicate salmon red touched with yellow, for massing. Duchess of Sutherland (A. Dickson), 1912—extremely vigorous, half trailing, flowers the color of the sweet briar but shaded citron yellow, white at base, good for the center of mass plantings and possibly as a cut flower. Edward Mawley (McGredy), 1911—flowers full, very large, rich velvety crimson, for massing. General Superior Arnold Janssen (Leenders), 1911—good grower, flowers full, large, deep carmine, for massing and cutting. Gorgeous (Hugh Dickson), 1915—large flower, well formed, deep orange yellow shaded copper yellow and veined with copper red, adapted to all purposes. George Dickson (A. Dickson), 1912—very vigorous, flowers very large, blackish velvety crimson scarlet. Hadley (A. N. Pierson), 1914—flowers full, deep velvety crimson, good for forcing as a cut flower. Hoosier Beauty (Dorner), 1915—very floriferous, flowers full, sparkling crimson, borne on erect, firm stems, excellent for forcing as cut flower or growing in the open air in France. Lieutenant Chauré (Pernet-Ducher), 1910—vigorous, large, full flower, red carmine shaded garnet, for massing or cutting. Lucien Chauré (Soupert and Notting), 1913—vigorous, flesh colored rose, for cutting or massing. Madame Caristie Martel (Pernet-Ducher), 1916—very vigorous, very large flowers, full, pure sulfur yellow, deeper at the center. Madame Charles Lutaud (Pernet-Ducher), 1912—large flower, chrome yellow lightly shaded with rosy saffron. Madame Edmond Rostand (Pernet-Ducher), 1912—flower elongated, full, clear rose shaded salmon and of a reddish orange yellow at center. Madame Jules Bouché (J. Croibier), 1910—vigorous, flower elongated, full, salmon white, for massing and cutting. Madame Lucien Baltet (Pernet-Ducher), 1911—flowers large, full, clear rose shaded yellow, for massing. Mrs. Charles Russel (Waban Conservatories), 1913—vigorous, erect, flower large, full, rose carmine, for massing, cutting, and growing in pots. Madame Marcel Delanney (Leenders), 1915—vigorous, floriferous, flowers large, full, soft, tender, shaded rose, stems long and strong; highly commendable. Mayflower (E. G. Hill)—erect, flowers large, white, petals margined with rose. (To be continued.)—*E. J. Kraus.*

1873. Turbat, E. **Les belles roses du groupe hybrides de thés distribueés depuis 1910. [Good hybrid-tea roses distributed since 1910.]** Rev. Hortic. [Paris] 92: 69–70. 1920.—A

continuation of similar article (Rev. Hortic. [Paris] 92: 49–50. 1920.). The following varieties are considered as most worthy: Melody (A. Dickson), 1911—vigorous, compact, flowers of good size, deep saffron yellow, good for massing or cutting. Mrs. Edward Powell (Bernaix), 1910—large flowers, uniform velvety carmine red, very good for massing. Mrs. Moorfield Storey (E. G. Hill), 1915—vigorous and erect, flowers enormous, tender rose, very good for massing and cutting. Ophelia (Wm. Paul), 1912—flower of perfect form, full, flesh colored salmon shaded with rose, widely grown in United States and England as a cut flower, but little known in France. Primrose (Soupert and Notting), 1912—fairly vigorous, flowers large, melon yellow shaded apricot, good for massing or cutting. Souvenir de E. Guillard (Chambard), 1912—large flowers, rosy yellow shaded coppery carmine. Souvenir de J. Passinge (Chambard), 1912—flowers large, coppery saffron lightly shaded carmine and deep yellow. Souvenir de Gustav Prat (Perner-Ducher), 1910—very large flowers, sulfur yellow. Sunburst (Pernet-Ducher), 1912—well known variety, adapted to all uses, massing, cutting or growing in pots. Senorita Carmen Sert (Pernet-Ducher), 1916—very vigorous, foliage bronze green, flower large, indian yellow shaded pale carmine rose, the edges of the petals striped with bright carmine. Two single varieties are mentioned: Princess Mary (E. J. Hicks), 1915—the largest single flower, crimson scarlet, anthers yellow, buds long and pointed. Red Letter Day (A. Dickson), 1914—flowers large, sometimes with two rows of petals, shining crimson scarlet, producing a good decorative effect. Judgment is reserved on varieties introduced since 1916. The descriptions of all the foregoing varieties are based on plants growing in central France.—*E. J. Kraus.*

1874. Turbat, E. **Les belles Roses nouvelles distribueés depuis 1910. [Good, new roses distributed since 1910.]** Rev. Hortic. [Paris] 92: 86–88. 1920.—A continuation of the general article on this subject (Rev. Hortic. [Paris] 92: 31–32; 49–50; 69–70. 1920.)—Two hybrid perpetual varieties are mentioned: Candeur Lyonnaise (Croibier, 1913)—seedlings of Reine des Nieges, large, double flower, pure white sometimes touched with sulfur yellow; and Louise Cretté (Chambard), 1915)—very vigorous, floriferous, large flowers, white tinted cream at center. The following varieties, all of which forms are adapted for massing in beds and for pot culture, belong to the Polyanthus or dwarf multiflora perpetual group. Andree Lenoble (E. Turbat and Co., 1916)—very vigorous, large clusters, double flowers, brilliant rose or clear red, very early; Baby Lyon Rose (E. Turbat and Co., 1916)—erect growth, double flowers, coral red; Bordure (Barbier and Co., 1911) very dwarf, flowers double, pure carmine, good for a border; George Elger (E. Turbat and Co., 1912)—erect growth, flower coppery gold passing to clear yellow, forces well; Ellen Poulsen (Poulsen, 1911)—vigorous, flowers in large clusters, double, deep shining rose, the best variety for pot culture and forcing; Jeanny Soupert (Soupert and Notting, 1912)—vigorous, large clusters of flowers, flesh-colored white; one of the best; Mme. Jules Gouchault (E. Turbat and Co., 1913)—large erect panicles, buds vermilion red shaded orange, passing to bright rose and then clear rose when open; Marie Brissonnet (E. Turbat and Co., 1913)—dwarf, large corymbs of medium sized flowers, flesh-colored rose bordered carmine; Maman Turbat (E. Turbat and Co., 1911)—very vigorous and hardy, flowers soft China rose, shaded clear peach pink and reddish yellow, the backs of the petals saffron and tender flesh white, excellent effect; Margenta (Barbier and Co., 1916)—dwarf, flowers semi-double, violet red passing to reddish violet; Merveille des Rouges (Dubreuil, 1911)—dwarf, flowers full, intense crimson with a white center; Renoncule (Barbier and Co., 1913)—dwarf, flowers shaped like a buttercup, brilliant salmon rose, very different from any other; Triomphe Orléanais (J. Peauger, 1912)—vigorous, flower deep scarlet red not tending to violet; Yvonne Rabier (E. Turbat and Co., 1910)—hardy, flowers white tinged clear sulfur yellow, of its class the best white for massing.—*E. J. Kraus.*

1875. Van den Heede, A. **Les plantes vivaces et rustiques: Les Gentianes. [Perennial, hardy plants: the gentians.]** Rev. Hortic. [Paris] 92: 84. 1920.—The various species of gentians, of which there are a large number, are particularly valuable when masses of blue color are desired. The red or yellow flowered forms seem less attractive. *Gentiana acaulis* L. is one of the best and most widely disseminated species.—*E. J. Kraus.*

1876. WILSON, E. H. **The cedars of Lebanon.** Garden Mag. 30: 178–183. *4 fig.* 1919.—An article discussing the cedar of Lebanon (*Cedrus libani*), giving its distribution in Asia and Africa. Mention is made of celebrated trees of this species in England and in the United States.—*H. C. Thompson.*

1877. WILSON, E. H. **The romance of our trees. II, The Ginko.** Garden Mag. 30: 144–148. *7 fig.* 1919.—History, description, and general discussion of this tree; its introduction and planting in Europe and America.—*H. C. Thompson.*

1878. WOLLEY-DOD, A. H. **A revised arrangement of British roses.** Jour. Botany Suppl. 58: 1–20. 1920.

## VEGETABLE CULTURE

1879. ENFER, V. **Semis de choux d'hiver.** [Seeding winter cabbage.] Rev. Hortic. [Paris] 92: 90–91. 1920.—In addition to a list of the varieties generally grown, general directions for sowing the seed and handling the young plants are given.—*E. J. Kraus.*

1880. ENFER, V. **Carrottes printanières.** [Spring carrots.] Rev. Hortic. [Paris] 92: 73–74. *Fig. 17–19.* 1920.—General directions on selection of varieties, preparation of soils, and time and method of planting.—*E. J. Kraus.*

1881. ENFER, V. **Le Céleri-rave.** [Celeriac.] Rev. Hortic. [Paris] 92: 38–39. 1920.—General cultural directions and the most profitable varieties are noted.—*E. J. Kraus.*

1882. ENFER, V. **Navets pour l'hiver.** [Turnips for winter.] Rev. Hortic. [Paris] 92: 129–130. 1920.—General directions are given regarding preparation of soils, selection of varieties, time of planting, harvesting, and storage.—*E. J. Kraus.*

1883. LACAITA, C. C. **The "Jerusalem artichoke." (Helianthus tuberosus.)** Kew Bull. Misc. Inf. [London] 1919: 321–339. 1919.—An historical account of the botany, culture, and common names assigned to *Helianthus tuberosus.*—*E. Mead Wilcox.*

1884. LESOURD, F. **Sur l'histoire du Topinambour.** [The history of the Jerusalem artichoke.] Rev. Hortic. [Paris] 92: 37–38. 1920.—The opinion of ASA GRAY that the native habitat of this species ranges through Canada to Saskatchewan, south to Arkansas and central Georgia, has been confirmed, in preference to the idea that it is a native of Peru or Brazil. Though first mentioned in botanical literature in 1616, it was at that time well known in the markets of France under the name "Topinambour," this term having been derived from the name of a tribe of Brazilian natives. It was brought from Canada to France, and thence introduced into England and Italy. Very few varieties are known. The following have been named and introduced: *yellow* (1808), *potato* (1895), and *spindle* (1916), by VILMORIN in France; *white* (1891), by SUTTON in England. COCKERELL has added *nebrascensis, alexandri, purpurellus,* and *purpureus.*—*E. J. Kraus.*

1885. MEUNISSIER, E. **La Cantaloup de Vaucluse.** [The Vaucluse Cantaloup.] Rev. Hortic. [Paris] 92: 102–103. 1920.—This melon is found on the Parisian markets from midsummer to mid-September. Though of small size and medium quality, it is grown in great abundance in the region of Cavaillon. The more specialized methods of growing it in that district are detailed. Artichokes are planted in August to follow the melon crop. These are harvested the following May and are in turn succeeded by a crop of beans.—*E. J. Kraus.*

1886. MEUNISSIER, E. **Choux-fleurs et Brocoli dans la Crau de Chateaurenard.** [Cauliflower and brocoli in "la Crau de Chateaurenard."] Rev. Hortic. [Paris] 92: 70–71. 1920.—In this district where irrigation is employed, these vegetables are grown in great abundance and sent to many markets. Brocoli is a late or winter cauliflower, and the two are not precisely distinguishable except that they mature at different seasons. General directions on the care of the young plants, transplanting, and cultivation are given The ground is

occupied by the earlier varieties for 4 to 6 months, and by the later varieties for 7 or 8 months. To have the ground in use throughout the year, a crop of early potatoes may alternate with the cauliflower and a crop of beans or lettuce with the brocoli.—*E. J. Kraus.*

1887. Truax, Hartley E. **United States grades for northern-grown onions.** U. S. Dept. Agric. Dept. Circ. **95**: 3–4. 1920.

1888. Truax, Hartley E. **United States grades for Bermuda onions recommended by the United States Department of Agriculture.** U. S. Dept. Agric. Dept. Circ. **97**: 2–4. 1920.

1889. Wittmack, L. **Gemüsesamenbau.** [**Vegetable seed culture.**] Landw. Hefte. **41** and **43**: 7–96. *30 fig.* 1919.—An extended account of the production of seeds, especially in Germany, of each of the garden vegetables. The work is divided into two parts. The first treats of general matters such as statistics, soils, fertilizers, seed quality, fructification, tillage, harvesting, cleaning and seed improvement. The second part is devoted to the growing of seed of each kind of vegetable.—*C. V. Piper.*

## HORTICULTURE—PRODUCTS

1890. Anonymous. [Rev. of: Hargreaves, W. A. **Cream of tartar manufacture in South Australia.** Bull. Dept. Chem. South Australia 3. *112 p.* 1916.] New Zealand Jour. Sci. and Tech. **1**: 126. 1918.—Average wine production of the state for 5 years from 1911 was 3,000,000 gallons a year, and total possible production of cream of tartar 64 to 126 tons.—*C. S. Gager.*

1891. Anonymous. **The Oil Palm.** Kew Bull. Misc. Inf. [London] **1919**: 238. 1919.—A brief note on *Elaeis guineensis nigrescens poissonii.*—*E. Mead Wilcox.*

1892. Bartlett, H. H. **The manufacture of sugar from Arenga saccharifera in Asahan, on the east coast of Sumatra.** Michigan Acad. Sci. Ann. Rept. **21**: 155–165. *Pl. 3–6.* 1919.—There is given a history of the natives, their customs, and the agricultural condition of the land. Then follows the history of the sugar palm, *Arenga pinnata* (Wurmb) Merr., or "bagot" as it is called by the natives, and the methods for its cultivation. The plant produces two kinds of "mayams" or spadices, male and female. The female spadix yields fruit but no juice, and the male *vice versa.* The saccharine juice collected from the male spadix contains a considerable amount of protein and will ferment quickly. The juice is often sterilized with smoke or hot water. The method of making the sugar is described in detail.—*H. C. Young.*

1893. Ghose, Manmathanath. **A neglected source of sugar in Bikar.** Agric. Jour. India **15**: 32–39. *3 pl.* 1920.—A discussion of the date palms as a source of sugar. Methods of tapping and flow and composition of the juice are discussed. From good trees 5000 to 7000 grams of juice twice daily can be secured from the middle of April to the end of May. The percentage of sucrose in juice averages 12.5, there being no appreciable difference in the day and night collections. The date palm in Bihar is considered an important source of cheap white sugar.—*J. J. Skinner.*

# MORPHOLOGY, ANATOMY, AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

1894. Bloch, E. **Modifications anatomiques des racines par action mecanique.** [**Anatomical modifications of roots by mechanical action.**] Compt. Rend. Acad. Sci. Paris **169**: 195–197. 1919.—Author continues previous work on the effect of compression on the structure of various plant organs. Plants of *Raphanus raphanistrum, Helianthus oleraceum, Polygonum tartaricum,* and *Soja hispida* were used. It is noted that compression of the roots or rhizomes of these plants did not affect normal development of other parts of the plant. Roots

were confined in glass tubes, and their diameter much reduced. Such roots differed from those in contact with soil in having a much reduced surface layer which was only slightly waterproofed. The parenchyma is much reduced, and the medullary rays are abundantly lignified. In roots which normally develop fibers (*Solanum oleraceum*) such tissues are completely suppressed. On the other hand, the tissues of the vascular system are little modified. Author finds that there are "tissues of adaptation," which are modified by external conditions, and "functional tissues," which are little modified by external factors.—*V. H. Young.*

1895. Burkill, I. H. **Notes on Dipterocarps. No. 4.** Jour. Straits Branch Roy. Asiatic Soc. **81**: 49–76. *213 fig.* 1920.—A continuation of notes No. 1, 2, and 3 in which the morphology of the seed and seedling of *Anisoptera costata* Korth. *Shorea macroptera* Dyer, *S. parvifolia* Dyer, *S. bracteolata* Dyer, *S. rigida* Brandis, *S. gibbosa* Brandis, *S. leprosula* Miq. and *S. robusta* Gaertn f. were given. The present note deals with the morphology of the embryo and seedling and position of the flower of *Dipterocarpus alatus* of Penang (?Rob), *D. fagineus* Vesque, *D. cornutus* Dyer, *D. sp. nov.*, *D. Scortechinii* King, *D. grandiflorus* Blanco, *D. crinitus* Dyer, *D. Kerrii* King, *Dyobalanops aromatica* Gaertn f., *Hopea micrantha* Hook f., *H. mengarawan* Miq., *Balanocarpus Curtisii* King, *B. zeylanicus* Trim., *Vatica nitens* King, *Retinodendron pallidum* King, *Anisoptera costata* Korth., *A. Curtisii* Dyer, *Balanocarpus penangianus* King, *Shorea costata* King, *S. materialis* Ridley, *S. gratissima* Dyer, *S. pauciflora* Dyer, *S. utilis* King, *S. macroptera* Dyer, *S. parrifolia* Dyer, *S. scutulata* King, *S. Curtisii* King, *S. sericea* Dyer, *S. rigida* Brandis, *S. bracteolata* Dyer, and *Pachynocarpus Wallichii.*—*T. F. Chipp.*

1896. Burkill, I. H. **Notes on Dipterocarps. No. 5.** Jour. Straits Branch Roy. Asiatic Soc. **81**: 3–4. *5 fig.* 1920.—A description of the morphology of the embryo and seedling of *Balanocarpus maximus* King.—*T. F. Chipp.*

1897. De Wildeman, Em. **Sur la Macaranga saccifera Pax, Euphorbiacée myrmécophile de l'Afrique tropicale. [On Macaranga saccifera Pax, a myrmacophilous plant of tropical Africa.]** Compt. Rend. Acad. Sci. Paris **169**: 394–396. 1919.—Author describes certain glands and sacs produced by the stipules of *Macaranga saccifera* Pax., a member of the Euphorbiaceae and a native of Belgian Congo and the surrounding country. Another species of Macaranga (*M. caladifolia* Beccari) has inflated hollow stems inhabited by ants; by some it is considered probable that the stipular sacs of *M. saccifera* are also inhabited by ants. Author finds that in spite of evidence of the presence of ants in the stipular sacs of the latter species, there is not enough evidence to conclude that the glandular structures found there are for the purpose of attracting ants. The matter of plant and ant symbiosis is briefly discussed.—*V. H. Young.*

1898. Dupler, A. W. **Staminate strobilus of Taxus canadensis.** Bot. Gaz. **68**: 345–366. *3 pl., 22 fig.* 1919.—The staminate strobili occur in the leaf axils, the buds being first distinguished from other types by the broad apex. The sporophyll primordia first appear as slightly rounded lobes above the general surface and may arise in acropetal succession. The archesporial initials are hypodermal cells and develop in eusporangiate fashion; they are four to eight in number and are distributed around the margin of the primordium. The sporogenous tissue reaches the mother-cell stage about October 1, and forms microspores about two weeks later; there is no abortion of sporangia, such as occurs in *Torreya*, the sporangia occurring in a circle around the stalk of the sporophyll. The sporangium wall is usually two-layered; the tapetum arises from the peripheral layer of the sporogenous tissue and persists until after megaspore formation. The sporangium epidermis remains alive and thin-walled at the base, dehiscence being accomplished by the rupture of these cells at maturity, by the elongation of the stalk of the sporophyll; owing to the disintegration of the sporangium wall, the epidermis is the functional wall in the later stages. The strobilus matures the latter part of April; just before maturity there is an enlargement and elongation of the axis, pushing the sporophylls beyond the scales. The strobili of *Taxus canadensis* are somewhat smaller than those of *T. baccata*. The strobilus bundles are collateral endarch, excepting in the ter-

minal portions of the scale bundles and the sporophyll bundles, where they may be mesarch; and in the latter show indications of occasional exarch structure, the terminal portion of these bundles also being concentric.—*A. W. Dupler.*

1899. Harlan, Harry V. **Daily development of kernels of Hannchen barley from flowering to maturity at Aberdeen, Idaho.** Jour. Agric. Res. **19**: 393–429. *Pl. 83–91, 17 fig.* 1920.

1900. Henry, Augustine, and Margaret G. Flood. **The Douglas Firs: a botanical and silvicultural study of the various species of Pseudotsuga.** Proc. Roy. Irish Acad. **B, 35**: 67–90. *Pl. 12–14.* 1920.—See Bot. Absts. 6, Entry 1544.

1901. Lecomte, Henri. **Sur la "structure etagée" de certains bois. [On the "storied structure" of certain woods.]** Compt. Rend. Acad. Sci. Paris **170**: 705–709. 1920.—The author contends that it is preferable to restrict the term "storied wood" to cases in which the wood rays are of about equal depth and in tangential section appear arranged in successive layers as are the windows of most buildings. To instances where there are rays of two sizes, only one of which is so arranged, he applies the term "semi-storied." He does not believe the word "storied" should be used as referring to the wood elements. Nine species of legumes and representatives of other families are listed as having storied wood-structure.—*C. H. and W. K. Farr.*

1902. Morvillez, F. **L'appareil conducteur foliaire des Hamamélidacées et des formes voisines. [The foliar conductive system of the Hamamelidaceae and related forms.]** Compt. Rend. Acad. Sci. Paris **169**: 542–545. *10 fig.* 1919.—Descriptions and drawings are presented of the foliar vascular apparatus of *Hamamelis virginiana L*; *Parrotia persica* D. C.; *Fothergilla alnifolia* L., *Disanthus cercidifolia* Max; *Bucklandia populnata* D. C.; *Liquidambar styraciflua* L.; *Altingia chinensis* Hook; *Platanus orientalis* L.; *Liquidambar imberbe* Ait., *Eriobotrya japonica* Lindl. and *Holodiscus discolor* Maxim. On the basis of these studies, the author has worked out a system of relationships among the groups of plants represented by the above species.—*V. H. Young.*

1903. Morvillez, F. **L'appareil libéroligneux foliaire des Bétulacées, Corylacées et Castanéacées. [The vascular anatomy of the leaves of the Betulaceae, Corylaceae, and Castaneaceae.]** Compt. Rend. Acad. Sci. Paris **170**: 674–677. *12 fig.* 1920.—These families are found to differ in their foliar vascular anatomy in very much the same way as do the Chrysobalaneae and the Leguminoseae; namely, in the number and development of the projecting portions of the vascular ring at the distal end of the petiole. These lateral projections are held to be of significance as a family characteristic.—*C. H. and W. K. Farr.*

1904. Schellenberg, G. **Ueber einige Arten der Gattung Rourea Aubl. [Several species of the genus Rourea Aubl.]** Bot. Jahrb. **56** (Beiheft): 21–29. 1920.

1905. Watson, E. E. **On the occurrence of root-hairs on old roots of Helianthus rigidus.** Michigan Acad. Sci. Ann. Rept. **21**: 235. 1919.—Root hairs were formed on roots occurring in the neighborhood of a bud at the end of a rhizome. These roots are one or two decimeters long. Root hairs occur throughout the entire length. They are 0.5 mm. or more long, nonseptate, and frequently branched, always dichotomously. Each comes from a small wedge-shaped epidermal cell.—*Richard de Zeeuw.*

## MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

1906. Brotherus, V. F. **Musci Weberbaueriani.** Bot. Jahrb. **56** (Beibl. 123): 1–22. 1920.—Previous collections of the moss flora of Peru have not been very extensive or very numerous. The principal ones are those of A. Mathews, R. Spruce, and E. Ule, with scattered records from other collectors. The present report is based on the collection made

by Dr. A. Weberbauer in 1901–1905, which contained 91 species, 29 of which are described as new, and 42 of which were not previously known in Peru. The region is diverse, extending from the tropical lowlands to the alpine summits, and with a markedly different amount of rainfall. On the drier hills and half-deserts the mosses are mostly on the ground, stones, and the branches of shrubs. In the more humid regions the moss covering becomes very thick. In the tropical rain forest this massive development is not present, but the greater diversity of the species makes up in importance for lack in quantity. The *Sphagnum* area lies on the east side of the Andes. A list of the species collected is given, together with notes on distribution and taxonomy. The following species are described as new: *Andreaea peruviana, Barbula subreplicata, Bartramia anacolioides, B. peraristata, Campylopus Weberbaueri, Crossidium peruvianum, Cyclodictyon flexicuspes, Dicranella longifolia, D. Weberbaueri, Encalypta peruviana, Entodon subflexipes, Fissidens ovicarpus, Funaria grossidens, Grimmia yaulensis, Isopterygium peruvianum, Lepidopilum splendens, Leptodontium laticuspes, L. laxifolium, Leucodon peruvianus, Mielichhoferia ampullacea, M. aristatula, M. plagiobryoides, M. subminutifolia, M. Weberbaueri, Pogonatum flaccidissimum, Prionodon fragilifolius, Ptychomitrium Weberbaueri, Schlotheimia calomitria, Streptopogon peruvianus,* and *Syrrhopodon diversifolius.*—*K. M. Wiegand.*

1907. Coulter, John M., and Merle C. Coulter. **Plant Genetics.** *ix + 214 p., 40 fig.* Univ. Chicago Press: Chicago, 1918.—See Bot. Absts. 2, Entry 395.

1908. Harshberger, J. W. **Alpine fell-fields of eastern North America.** Geog. Rev. 7: 233–255. *12 fig.* 1919.—See Bot. Absts. 3, Entry 1964.

1909. Land, W. J. G. **Multiple eggs in bryophytes.** [Rev. of: Florin, Rudolf. **Das Archegonium der Riccardia pinguis (L) B. Gr.** Svensk. Bot. Tidsk. 12: 464–470. *4 fig.* 1918. (See Bot. Absts. 2, Entry 1280.)] Bot. Gaz. 68: 392. 1919.—The reviewer calls attention to the frequency among the bryophytes of such so-called abnormalities as those described by Florin, and discusses their importance from a phylogenetic standpoint.—*A. W. Evans.*

## MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*

### FUNGI

1910. Barlot, J. **Sur la détermination d'Amanites venéneuses à l'aide de réactions colorées. [The identification of poisonous Amanitas by color reactions.]** Compt. Rend. Acad. Sci. Paris 170: 679–681. 1920.—Color reactions with various chemicals are found to be of assistance in distinguishing the poisonous from non-poisonous species of *Amanita.* No single reaction has been found which is absolutely diagnostic, but three deadly species turn black when treated with a drop of fresh blood to which has been added some potassium ferrocyanide. Other reactions are found for other species.—*C. H. and W. K. Farr.*

1911. Bessey, E. A. **Guide to the literature for the identification of fungi—A preliminary outline for students and others.** Michigan Acad. Sci. Ann. Rept. 21: 287–316. 1919.—A list of the more accessible general works and special monographs on fungi has been prepared for the service of students. "No attempt is made to cover the older literature; with few exceptions, only those special studies are noticed that have appeared since the first volume of Saccardo saw light." "Only those works are listed that bear upon groups more or less represented in the United States, particularly the eastern half." The bibliography given takes up first the general works, hand books and host indexes, and then special works for limited groups of fungi. The arrangement of the special articles cited follows the systematic arrangement of the fungi. Approximately 700 titles are included in the list given.—*G. H. Coons.*

1912. BESSEY, E. A., AND BERTHA E. THOMPSON. **An undescribed Genea from Michigan.** Mycologia 12: 282–285. *Pl. 20.* 1920.—A *Genea* with rectangular ascospores is described as *G. cubispora* sp. nov.—*H. R. Rosen.*

1913. CHIPP, T. F. **A host index of fungi of the Malay Peninsula. II.** Gardens' Bull. Straits Settlements 2: 276–282. 1920.—A conclusion of the summary of fungous diseases of plants in Malaya as hitherto recorded.—*T. F. Chipp.*

1914. DICKSON, B. T. **Onygena equina (Willd.) Pers.** Mycologia 12: 289–291. *1 fig* 1920.—Reports *Onygena equina* growing on cow's horns and hoofs at Quebec, Canada.—*H. R. Rosen.*

1915. FITZPATRICK, HARRY MORTON. **Monograph of the Coryneliaceae.** Mycologia 12: 239–267. 1920.—The conclusion of work previously noted (see Bot. Absts. 6, Entry 1217). The genus *Corynelia* is described and a key to species is given, followed by a description of each species. The following new species are included: *C. bispora, C. nipponensis, C. brasiliensis, C. portoricensis,* and *C. jamaicensis.* Doubtful and excluded species of the family are discussed, and in this connection *Hypsotheca thujiana* E. & E. is listed as probably belonging to the genus *Caliciopsis.*—*H. R. Rosen.*

1916. FRASER, W. P. **Cultures of Puccinia Clematidis (DC.) Lag. and Puccinia Impatientis (Schw.) Arth.** Mycologia 12: 292–295. 1920.—Overwintered telial material of *Puccinia Clematidis* on *Hystrix patula* produced infections on *Actaea rubra,* with the production of aecia. These aecia as well as others collected in the field were inoculated and produced infections on the following grasses: *Elymus canadensis, E. virginicus, Hordeum jubatum, Hystrix patula,* and *Agropyron Richardsonii.* According to E. B. MAINS the aecial and telial material corresponds to the European *Puccinia Actaeae-elymi* Mayor and *P. Actaeae-agropyri* Ed. Fisch. It seems best to include these under one species, *P. Clematidis* (DC.) Lag., which is made up of several races. Inoculations with aeciospores from *Thalictrum dasycarpum* produced infections on *Bromus ciliatus, B. latiglumis, Elymus canadensis,* and *E. virginicus.* Since the resulting teliospores on *Bromus* were of the many-celled type, and on *Elymus* of the two-celled type, the author believes that the *Thalictrum* aecia used in the inoculations consisted of a mixture of aecia of two races. Using aecial material of *Puccinia impatientis* (Schw.) Arth. on *Impatiens biflora* the following grasses were infected: *Agropyron tenerum, A. Richardsonii, Hystrix patula, Elymus canadensis, E. virginicus,* and *Hordeum jubatum.*—*H. R. Rosen.*

1917. GROVE, W. B. **Species placed by Saccardo in the genus Phoma. Part II.** Kew Bull. Misc. Inf. [London] 1919: 425–445. *Fig. 1–6.* 1919.—For part I, see Kew Bull. Misc. Inf. [London] 1919: 177–201.—Includes lists of host plants for parts I and II.—*E. Mead Wilcox.*

1918. LEHMAN, S. G. **Penicillium spiculisporum, a new ascogenous fungous.** Mycologia 12: 268–274. *Pl. 19.* 1920.—From healthy cotton rootlets a *Penicillium* was obtained which produced perithecia in abundance on various culture media. It is described as *P. spiculisporum* sp. nov.—*H. R. Rosen.*

1919. MURRILL, W. A. **A new Amanita.** Mycologia 12: 291–292. 1920.—*Venenarius Wellsii* sp. nov. is described. "For the benefit of those following Saccardo . . . . the combination *Amanita Wellsii*" is added.—*H. R. Rosen.*

1920. MURRILL, W. A. **Kauffman's Agaricaceae.** [Rev. of: KAUFFMAN, C. H. **The Agaricaceae of Michigan.** Michigan Geol. and Biol. Surv. Publ. 26. Vol. 1 (text), *xxvii + 924 p.* Vol. 2 (plates), *10 p. text and 172 pl.* 1918.] Mycologia 12: 166. 1920.—The reviewer regards this as a "stupendous piece of work splendidly done."—*H. R. Rosen.*

1921. Ritzema Bos, J. **Boekaankondiging.** [Book review.] [Rev. of: Oudemans, C. A. J. A. **Enumeratio systematica fungorum.** Vol. I. *cxxvi + 1230 p.* Martinus Nijhoff: The Hague, 1919.] Tijdschr. Plantenz. **25**: 210–211. 1919.—A critical review.—*H. H. Whetzel.*

1922. Vuillemin, Paul. **Fructifications de Champignons decouvertes dans l'ongle par Louis Jannin.** [The fructifications of fungi found on finger-nails by Louis Jannin.] Compt. Rend. Acad. Sci. Paris **170**: 788–790. 1920.

1923. Zundel, George L. **Some Ustilagineae of the state of Washington.** Mycologia **12**: 275–281. 1920.—There are recorded forty-two species of smuts, including *Tilletia guyotiana* Har. and *T. rauwenhoffii* Fisch. de Wald.—two species which are said to be here recorded for the first time from North America.—*H. R. Rosen.*

## BACTERIA

1924. Danysz, J. **La vie d'un microbe, individu et espèce.** [The life of a microbe individual and species.] Compt. Rend. Acad. Sci. Paris. **169**: 104–106. 1919.

# PALEOBOTANY AND EVOLUTIONARY HISTORY

E. W. Berry, *Editor*

1925. Berry, E. W. **A fossil sea bean from Venezuela.** Amer. Jour. Sci. **50**: 310–313. *1 fig.* 1920.—Describes a fossil sea bean, *Entada boweni*, which is almost identical with the existing *Entada scandens*, and comes from the Miocene of the foot-hills of the Sierra de Merida in Venezuela.—*E. W. Berry.*

1926. Berry, E. W. **Contributions to the Mesozoic flora of the Atlantic Coastal Plain, XIII.—North Carolina.** Bull. Torrey Bot. Club **47**: 397–406. *Fig. 2.* 1920.—A summary account of the Upper Cretaceous flora of North Carolina. Many well-known Upper Cretaceous species are enumerated and fruits of *Ficus* and species of *Aristolochites*, and *Carpolithus* are described as new.—*E. W. Berry.*

1927. Berry, Edward W. **Paleobotany: A sketch of the origin and evolution of floras.** Smithsonian Report **1918**: 289–407. *6 pl., 42 fig.* 1920.—A general account of the science, with an illustrated discussion of the morphology, habits, and phylogeny of plants, and a description of the successive floras of geologic time.—*E. W. Berry.*

1928. Carpentier, Alfred. **Sur les fructifications du Sphenopteris herbacea Boulay.** [On the fructifications of Sphenopteris herbacea Boulay.] Compt. Rend. Acad. Sci. Paris **169**: 511–513. 1919.

1929. Scott, D. H. **The relation of the seed plants to the higher cryptogams.** (Abstract.) Rept. British Assoc. Adv. Sci. **1919**: 334. 1920.

1930. White, O. E. **The ancient history of plants.** Brooklyn Bot. Gard. Leafl. $8^{3-5}$: 1–8. 1920.

1931. Yabe, H., and Endo, S. **Discovery of a stem of Calamites from the Paleozoic of Japan.** Jour. Geol. Soc. Tokyo **27**: 65–69. *1 fig.* 1920.—The coal measures of China, Manchuria, and to a less extent Korea are abundantly plant bearing, but in Japan these are represented by marine limestones. No remains of terrestrial vegetation of Carboniferous age have been known from Japan except a supposed fragment of a Sigillaria which is very doubtful both as to age and identity. The authors record from what is probably the Chichibu formation, of Carboniferous age, a fragment of a calamite whose anatomical characters suggest the Arthropitys type of calamite stem structure. The material which came from marine beds in the province of Iwami, is not sufficiently well preserved to permit a more precise identification.—*E. W. Berry.*

# PATHOLOGY

G. H. Coons, *Editor*
C. W. Bennett, *Assistant Editor*

1932. Anonymous. **Beschädigungen an Eichen durch Diaporta taleola Tul. [Injury to oak by Diaporta taleola Tul.]** Schweiz. Zeitschr. Fortsw. 69: 62–63. *Frontispiece.* 1918.—The disease described by Moreillon in *Forestier Suisse,* according to Dr. Schellenberg, is caused by *Diaporthe* (*Aglaospora*) *taleola.* A description and illustration of the affected tree and a short description of the organism.—*D. Reddick.*

1933. Anonymous. **The ring or Bangadi disease of potato.** Leaflet Dept. Agric. Bombay 1918: 3. 1918.—This ring disease, known to the people as *bangadi* or *chari,* is characterized at first by partial and later by complete withering of the potato plants, which then turn brown and dry up. Cross sections of tubers from diseased plants show a brown ring from which a cream-yellow bacterial slime oozes under slight pressure. Both field and storage rots result. It appears to be spread in the field by irrigation water. The disease originates in infected seed and is therefore to be avoided by the use of healthy seed, proper disinfection of the cutting knife after a diseased tuber is cut, and by good field sanitation and drainage since the trouble develops most seriously in water-logged areas. The name of the causal organism is not given.—*H. A. Edson.*

1934. Anonymous. **Bestrijding van schurftziekte bij appelen en peren. [Control of scab on apples and pears.]** Tijdschr. Plantenz. 26: 108. 1920. Newsletter No. 13 of the Phytopathological Service, March, 1920.—Outlining spraying program, and methods of making spray mixtures.—*H. H. Whetzel.*

1935. Bessey, E. A. **The effect of parasitism upon the parasite—A study in phylogeny.** Michigan Acad. Sci. Ann. Rept. 21: 317–320. 1919.—In a brief account, the writer considers various steps involved in change from the holophytic to parasitic habit in plants of various orders of evolutionary complexity. Epiphytism is considered the first step toward parasitism. "The next step seems to have been partial or total endophytism." This type of relationship shows various degrees from the simple shelter and partial feeding in Chlorochytrium, to the endophytism shown in certain red seaweeds which, while still possessing chloroplasts, adopt a filamentous form of structure. Among the higher plants the mistletoes (*Viscum* or *Phoradendron*) are comparable to this type of relationship. Following endophytism true parasitism is found either intra- or intercellular in the host relationship. In the case of complete parasitism, a considerable reduction of the plant body and an increase in size of reproductive structures take place, but among the yeasts and some other forms a reduction of the reproductive structures occurs. Clearly the simpler the structure to begin with, the slighter the change beyond loss of chlorophyll and chloroplasts. With the plants of more complicated vegetative structure two tendencies appear—a simplification and reduction of all organs for photosynthesis, and an emphasizing of the reproductive portions. When, however, the former tendency is carried too far, as in the yeasts, the reproductive portion has to be reduced as well.—*G. H. Coons.*

1936. Bintner, J. **Silver leaf disease. Stereum purpureum.** Kew Bull. Misc. Inf. [London] 1919: 241–263. *Pl. 8, fig. 1–8.* 1919.—This disease is known to attack the following plants:—*Prunus* spp., *Malus sylvestris, Exochorda* sp., *Neviusia alabamensis, Philadelphus* sp., *Spiraea japonica glabrata, Ribes cereum, Ribes* spp. (currants and gooseberries), *Laburnum alpinum* and *vulgara, Syringa* sp., *Aesculus carnea* and *hippocastanum, Pernettya mucronata.* The hyphae of this pathogene are always found in the stem and roots of silver-leaf trees, though they have never been found in either the petiole nor the leaf blades of such trees. True silver leaf caused by this pathogene is distinguished from false silver leaf not caused by any organism. Infection occurs through wounds on stems or roots. A bibliography and historical account of the disease are given.—*E. Mead Wilcox.*

1937. Chipp, T. F. **A host index of fungi of the Malay Peninsula. II.** Gardens' Bull. Straits Settlements 2: 276–282. 1920.—See Bot. Absts. 6, Entry 1913.

1938. Coons, G. H. **The Michigan plant disease survey for 1918.** Michigan Acad. Sci. Ann. Rept. 21: 331–343. *Pl. 15.* 1919. –Reports are given upon the disease occurrence in cereals, fruits, etc., in Michigan in 1918. These are the result of observations by the author and by other persons coöperating. A short discussion of "The weather of 1918" and "Weather injury to plants" precedes the accounts of the different crops and their diseases.—*E. A. Bessey.*

1939. Coons, G. H., and Genevieve Gillette. **Phenol injury to apples.** Michigan Acad. Sci. Ann. Rept. 21: 325–329. *Pl. 14.* 1919.—As a result of tests in exposing apples to the fumes of phenol in concentrations as low as 1 to 1000, blackening of the skin and flesh occurred, the speed of reaction increasing with concentration of phenol and with temperature. The reaction did not take place with apples which had been killed by boiling. With apple juice, discoloration occurred with apple cells in the juice but not in the juice itself, upon the addition of phenol. "The reaction is connected with living cells and is not the mere chemical effect of one substance upon another. The response of mature cells and the failure of the dead cells in the mellow apples to respond point to the possibility of this substance furnishing a criterion for active and for dead cells." It may be that the phenol reacts with some oxydizing enzyme. such as tyrosinase, producing the blackening.—*G. H. Coons.*

1940. Coons, G. H., and H. H. McKinney. **Formaldehyde injury to wheat.** Michigan Acad. Sci. Ann. Rept. 21: 321–324. 1919.—In a preliminary note authors summarize results of experiments on formaldehyde injury to wheat. The injury is readily produced in the laboratory, wheat being more sensitive than oats, barley, or rye. The standard wet treatment (1 pint of formaldehyde to 40 gallons of water) or the new dry treatment (1 pint of formaldehyde atomized on 50 bushels of grain) reduces germination slightly—but not more than 10 per cent. Formaldehyde does not air readily out of grain. The action of this relict formaldehyde is cumulative, its toxic action being shown either by killing of embryo or by the production of grave distortion. Under cold, wet conditions very little formaldehyde will air from grain. Damp soil readily takes up formaldehyde from grains, preventing damage. Dry soil does not take up formaldehyde readily. Toxicity of formaldehyde varies with the dilution. The experiments were performed with small quantities of wheat in low glass dishes, and the amount of formaldehyde used was calculated from the delivery of an atomizer. The treated grain was germinated in soil, blotting paper results not being found to compare with field studies.—*G. H. Coons.*

1941. Dufrénoy, Jean. **Sur les tumeurs bactériennes expérimentales des pins. [On experimental bacterial tumors of pines.]** Compt. Rend. Acad. Sci. Paris 169: 545-547. 1919.—*Pinus sylvestris* and *P. laricio* are deformed by tumors identical with those affecting *P. maritima* and capable of transmission from tree to tree. By means of needle inoculations from tree to tree, cankers were obtained in a few months and resinous tumors in a year. The anatomy of these tumors is briefly described. The causal organism is an unnamed Coccus of which pure cultures were obtained by inoculating media directly from the host. The organism brings about hyperplasia in the infected regions, and finally the tissues break down leaving a resinous mass.—*V. H. Young.*

1942. Ehrhorn, E. M. **Notes on plant shipment.** Hawaiian Forester and Agric. 17: 4–6. 1920.—This article emphasizes the importance and necessity for the rules issued by the Division of Plant Inspection, and gives also directions for the safe shipment of p ants under the rules.—*Stanley Coulter.*

1943. Fisher, D. F., and Newcomer, E. J. **Pear scab in the Pacific Northwest.** Better Fruit 14[9]: 3–6. 1920.—A verbatim excerpt from U. S. Dept. Agric. Farmers Bull. 1056. 1919.

1944. Fryer, Percival J. **Insect pests and fungus diseases of fruit and hops.** *xv + 728 p., 24 pl.* University Press: Cambridge, England, 1920.

1945. Gunderson, A. J. **Some facts about dry lime-sulphur.** Better Fruit $14^{10}$: 42. 1920.—This is a detailed account of the spraying and killing efficiency of dry lime-sulphur as compared with ordinary boiled lime sulphur. The chemical composition of dry lime-sulphur is considered in detail.—*A. E. Murneek.*

1946. Heinsius, H. W. **Kort verslag van de algemeene vergadering op vrijdag 20 juni 1919, in den hortus botanicus te Amsterdam.** [Secretary's report of the annual meeting of the Phytopathological Society of Holland.] Tijdschr. Plantenz. 25: 202–204. 1919.

1947. Hiley, W. E. **The fungal diseases of the common larch,** *8 vo., xii + 204 p., 73 pl.* Clarendon Press: Oxford, 1920.

1948. Kühr, C. A. H. von Wolzogen. **Het zure bibitrot bij het suikerriet.** [Sour cutting-rot of sugar cane.] Arch. Suikerindust. in Nederlandsch-Indië 28: 703–756. *24 fig.* 1920. Also, Mededeel. Proefstat. Java Suikerindust. Landb. Ser. 1920, No. 3.—The sour cutting-rot retards or kills small scattered areas in the young cane fields, giving an appearance similar to damage resulting from the "pineapple" disease. The interior of affected cuttings shows a red to brown discoloration in more or less irregularly scattered patches and has a sour odor. The affected cutting is found to be at first acid, but later in the course of the fermentation it is alkaline, doubtless through ammonia production. The initial process is typically an acetic acid fermentation, though in exceptional cases of poor soil aeration lactic and butyric acid fermentations occur. A number of different bacteria were cultivated from sap expressed from affected cuttings, and their fermenting ability was studied *in vitro*. Isolation of a specific organism was not attempted, and controlled inoculation experiments were not made. The writer believes that the fermentation of the cuttings is caused by common soil bacteria, and that the harmful effect on the plant is due to the absorption from the cutting of the acids produced in the fermentation occurring before the roots become well enough established to make the plant independent of the cutting. For control the writer recommends the improvement of all conditions which further the rapid germination and establishment of the plantlets on their own roots.—*R. D. Rands.*

1949. Mann, Harold H., S. D. Nagpurkar, and G. S. Kulkorni. **The "Tambera" disease of potato.** Agric. Jour. India 15: 282–288. *4 pls.* 1920.—The disease which prevailed in the Poona district of western India, known locally as "Tambera," was found to be caused by mites. A description of the affected plants is given, and remedies are suggested.—*J. J. Skinner.*

1950. Meier, F. C. **Control of watermelon anthracnose by spraying.** U. S. Dept. Agric. Dept. Circ. 90: 3–11. *8 fig.* 1920.—"The most practicable method of reducing the damage done by anthracnose is to spray the watermelon vines with 4–4–50 bordeaux mixture." This operation will also help to control other diseases of the crop. Directions are given regarding time and manner of spraying and for the preparation of bordeaux. The disease is described, and the method by which the causal fungus (*Colletotrichum lagenarium*) is spread is discussed. —*L. R. Hesler.*

1951. Nicolas, G. **Sur la respiration des plantes parasitees par des champignons.** [The respiration of plants parasitized by fungi.] Compt. Rend. Acad. Sci. Paris 170: 750–752. 1920.—A comparison of the carbon dioxide-oxygen ratio of sound and diseased specimens of five genera of angiosperms. Seven genera of fungi were involved as disease-producing organisms. It is found that the respiration of organs parasitized with endophytes, such as rusts and *Cystopus*, and by subcuticular fungi, such as *Taphrina*, is greater than that of sound organs. The reverse is true of organs attacked by ectophytes, such as mildew. *C. H. and W. K. Farr.*

1952. Owen, M. N. **The skin spot disease of potato tubers (Oospora pustulans).** Kew Bull. Misc. Inf. [London] 1919: 289–301. *Pl. 11, 11 fig.* 1919.—This is a storage disease of Irish potato tubers, caused by the fungous pathogene *Oospora pustulans*, here described as a new species by Owen and Wakefield. It is shown to be distinct from *Spicaria solani* Harting, which name has been assigned to it by other authors. Small dark spots occur scattered over the surface of the tuber. Infection near the eyes may kill the buds. Diseased tubers should not be planted.—*E. Mead Wilcox.*

1953. Parsons, T. H. **Notes on the effects of shell fire on trees in woods in France.** Kew Bull. Misc. Inf. [London] 1919: 231–233. *Pl. 6–7.* 1919.

1954. Peltier, G. L. **A summary of the citrus canker investigation in south Alabama.** Proc. Gulf Coast Hortic. Soc. 4: 21–22. 1918.

1955. Peltier, George L., and William J. Frederich. **Relative susceptibility to citrus-canker of different species and hybrids of the genus Citrus, including the wild relatives.** Jour. Agric. Res. 19: 339–362. *Pl. 57–68.* 1920.—Continuation of previous work. (See Bot. Absts. 1, Entry 924.) The tests were made both in greenhouse and in field. With a single exception the data confirm those of Lee (Bot. Absts. 2, Entry 774). *Pscudomonas citri* has a wide range of hosts and is not limited to the genus *Citrus*. Of the rutaceous plants not closely related to *Citrus*, infection was secured on *Casimiroa edulis*, *Chalcas exotica*, and *Claucena lansium*. The lesions are non-typical, unruptured spots and occur at wounds or scratches on the leaves. *Xanthoxylum* sp. and *Glycosmis pentaphylla* are immune.—In the tribe Citreae species in sub-tribes have been tested as follows: In Angelinae, *Chaetospermum glutinosum* is susceptible, with lesions somewhat like those on *Citrus*; *Aegle marmelos* is slightly susceptible; *Balsamocitrus dawei* and *Aeglopsis chevalieri* are immune. In Feroninae, *Feronia limonia* and *Feroniella lucida* were infected, and lesions developed in absence of wounds. In Lavanginae, *Hesperthusa crenulata* was infected on twigs and leaves, although the lesions are non-typical, while *Triphasia trifolia* and *Severinia buxifolia* are immune. In Citrinae, all plants tested were infected, only *Citropsis schweinfurthii* and *Fortunella margarita, japonica* and *crassifolia* showing any marked resistance.—Only those wild relatives which were most susceptible in the greenhouse could be infected in the field. So far as the citrus industry of U. S. A. is concerned none of the wild relatives, native or introduced, now growing in the citrus districts is susceptible enough to have any bearing on the national program for the eradication of citrus canker. A possible exception is *Poncirus trifoliata*.—The species of *Citrus* show no change in relative susceptibility from previous report. *Citrus nobilis* and its varieties are resistant.—Of the hybrids, those having *Poncirus trifoliata* as one parent are susceptible; citrange hybrids, particularly citrangequats, are decidedly resistant.—All false hybrids are extremely susceptible.—*D. Reddick.*

1956. Putterill, V. A. **Flag smut of wheat.** Jour. of Dept. Agric. Union of South Africa, 1: 252–257. *5 fig.* 1920.—Flag smut in wheat, caused by *Urocystis tritici*, has recently been recorded from Zeerust district. An outline is given of the life history of the fungus, and preventive measures are suggested.—*E. M. Doidge.*

1957. Rambousek, Fr. **Rübenschädlinge und Rübenkrankheiten im Jahre 1917.** [**Enemies and diseases of beets in 1917.**] Zeitschr. Zuckerind. Böhmen 42: 527–539. 1918.

1958. Ritzema Bos, J. **Boekaankondiging.** [Book review.] [Rev. of: J. Kok. **Vijanden van landbouwgewassen.** (**Enemies of cultivated plants.**) **2d. ed.** 1919.] Tijdschr. Plantenz. 26: 115–116. 1920.—The contents of the work are divided into three parts, the first dealing with injuries due to the environment; the second, injuries due to animals including insects; and the third part dealing with diseases due to pathogenic plants, especially the fungi. A list of errors and misstatements found in the book is given.—*H. H. Whetzel.*

1959. Schoevers, T. A. C. **Ziekten van aardappel knollen. [Diseases of potato tubers.]** Tijdschr. Plantenz. **26**: 5–20. *3 pl., 13 fig.* 1920.—A brief description of twenty diseases affecting the tubers of potato. The symptoms, especially those exhibited by the tubers, are described, and standard methods for control are given. Among the diseases described are: *Rhizoctonia* disease, Wart, *Fusarium* rot, scab, tuber proliferation, bacterial soft rot, red rot, *Phytophthora* rot, ring necrosis, silver scurf, *Verticillium* disease, nematode disease, hollowness, and powdery scab. Half-tone illustrations of many of the diseases and a key for determining the diseases from an examination of the tubers, accompany the text.—*H. H. Whetzel.*

1960. Schreiner, Oswald, B. E. Brown, J. J. Skinner, and M. Shapovalov. **Crop injury by borax in fertilizers.** U. S. Dept. Agric. Dept. Circ. 84: *35p. 25 fig.* 1920.—See Bot. Absts. 6, Entry 1431.

1961. Stäger, R. **Beitrag zur Verbreitungsbiologie der Claviceps-Sklerotien. [Dissemination of Claviceps sclerotia.]** Verh. Schweizer Naturw. Gesell. **99**: 236–237. 1918.—Sclerotia of *Claviceps* do not simply fall to the ground and lie there until the following spring. They may be spread widely with the host (sclerotia from *Brachypodium, Agropyrum, Lolium, Arrhenatherum elatius*, and *Alopecurus myosuroides*); they may be disseminated by the inherent condition of low specific gravity which allows them to float on water (sclerotia from *Molinia coerulea, Glycerina fluitans, Phalaris* and *Phragmites*); they may be distributed by a union of the distribution apparatus of host and parasite to mutual advantage (as in case of species of *Holcus, Poa nemoralis, P. annua* and *Dactylis glomerata*); with sclerotia of low specific gravity, wind transport is possible. A combination of wind and water movement exists for sclerotia from *Phragmites* and *Calamagrostis arundinacea.* [Through abst. by Matouschek in: Zentbl. gesamte Landw. 1, Entry 355. 1919.]—*D. Reddick.*

1962. Stehlik, W. **Bekämpfung des Wurzelbrandes bei der Zuckerrübe durch ihre Züchtung. [Control of sugar beet root-rot by breeding.]** Öst-Ung. Zeitschr. Zuckerind. u. Landw. **47**: 1–10. 1918.—[Abst. by Molz in: Zentralbl. gesamte Landw. 1, Entry 277. 1920.]

1963. Taubenhaus, J. J. Diseases of greenhouse crops and their control. Dutton & Co.: New York, 1920.

1964. Thornber, J. J. **Plant disease inquiries.** Arizona Agric. Exp. Sta. Rept. **1917**: 431–432. 1918.—A short list of diseases occurring in Arizona in 1917.—*D. Reddick.*

1965. Valleau, W. D. **Seed corn infection with Fusarium moniliforme and its relation to root and stalk rots.** Kentucky Agric. Exp. Sta. Bull. **226**: 25–51. *Fig. 1.* 1920.—An examination to determine the seed-borne organisms in seed of *Zea Mays* L. which might cause root and stalk rots of corn resulted in finding *Fusarium moniliforme* Sheldon in all samples of corn examined from the states of Kentucky, Kansas, Arkansas, Missouri, Tennessee, Georgia, Mississippi and Minnesota. No disease-free ears were found, and practically one hundred per cent infection of kernels on an ear was the rule. Infection on an ear was found not to be localized. The high degree of seed infection probably explains the equally extensive root infection under field conditions. The rag doll and other germinators in which seedlings were grown only to a height of 3 or 4 inches were of little value in determining the extent of kernel infection on an ear. Sand germinators in which the seedlings were grown to a height of 12 to 22 inches were used, the seedlings being removed and washed and the roots and stems examined for lesions. The development of pink, scarlet, purple, or black discolorations within the seed coats, in any type of germinator indicated infection with *F. moniliforme.* Pink discolorations on dry white kernels are an indication of infection. Isolations from rotting roots and stalks in the field yielded *F. moniliforme* in the majority of cases. Infection with *F. moniliforme* generally has little effect on the germination or early vigor of the resulting seedling.—*W. D. Valleau.*

1966. Van der Bijl, Paul A. **A list of host-plants of some of the Loranthaceae occurring round Durban, Natal.** South African Jour. Sci. 16: 345–347. 1920.—These mistletoes not only occur on a large number of South African plants, but have also adapted themselves to a number of introduced trees, including fruit trees.—*E. P. Phillips.*

1967. Verhoeven, W. B. L. **Zaaigraanonsmetting.** [Seed grain disinfection.] Tijdschr. Plantenz. 26: 24–27. 1920.—A reprint of Vlugschrift No. 16 of the Phytopathological Service issued December, 1919. Standard directions for seed treatment to control the following diseases are given: Stinking smut of wheat and barley with copper sulphate, formalin, and Uspulum; loose smut of wheat and barley with hot water; oat smut with hot water; stripe of barley with copper sulphate; stem smut of rye with copper sulphate; seedling mold of wheat, oats, barley, and rye with hot water or copper sulphate.—*H. H. Whetzel.*

1968. Vermorel and Dantony. **Efficacité comparée de bouilles bordelaises ordinaires et des bouilles bordelaises caséinées pour la préservation des grappes.** [Comparative efficiency of ordinary bordeaux mixture and bordeaux mixture with the addition of casein in the treatment of grapes.] Compt. Rend. Acad. Sci. Paris 169: 439–440. 1919.—Experiments were carried out with bordeaux mixture to which was added fifty grams of casein per hectoliter. Chemical tests of grape tissues over a period of forty-five days indicated that the mixture adheres much better if casein is added and that it remains on the tissues in spite of rain and unfavorable weather conditions without loss of efficiency.—In the treatment of grapes for mildew this promises to be a great advantage, since the spray is not easily applied to the fruits except when the leaves are small and consequently must be of a type which adheres well and does not lose its efficiency.—*V. H. Young.*

1969. Volkerz, K. **Iets over plaatselijk onderzoek van bloembollenziekten.** [Remarks on the locating of investigations on bulb diseases.] Tijdschr. Plantenz. 26: 61–70. 1920.—The writer urges that scientific investigations on plant diseases be conducted in the fields or in localities where conditions for normal crop production of the host is best.—*H. H. Whetzel.*

1970. Wester, P. J. **The coconut, its culture and uses.** Philippine Agric. Rev. 11: 5–57. 1918.—Diseases of coconut are reviewed briefly on pages 45 to 47.—*D. Reddick.*

1971. Woodcock, E. F. **Observations on the potato disease conditions in Michigan for the summer of 1918.** Michigan Acad. Sci. Ann. Rept. 21: 281–285. 1919.—A summary of data showing distribution and extent of injury by potato diseases in the summer of 1918, in Michigan.—*G. H. Coons.*

1972. Zundel, George L. **Some Ustilagineae of the state of Washington.** Mycologia 12: 275–281. 1920.

## PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

Heber W. Youngken, *Editor*
E. N. Gathercoal, *Assistant Editor*

1973. Anonymous. **Datura Stramonium, "Stinkblaar," "Stramonium" or "Thorn Apple."** South African Jour. Indust. 3: 455–461. 1920.

1974. Anonymous. **Momordica cochinchinensis.** Kew Bull. Misc. Inf. [London] 1920: 6–12. 1920.—The oil from the seeds may possibly be employed in the manufacture of paints and varnishes.—*E. Mead Wilcox.*

1975. Anonymous. **Strychnos nux-vomica in Cochin China.** Kew Bull. Misc. Inf. [London] 1919: 238–239. 1919.—The plant is found to be indigenous to Cochin China.—*E. Mead Wilcox.*

1976. Bliss, A. R. **Proposed vegetable drug deletions.** Jour. Amer. Pharm. Assoc. 9: 767–771. 1920.—A summarized report of answers received from 387 physicians of Atlanta, Georgia, relative to the various vegetable drugs of the United States Pharmacopoeia, in regard to their retention or deletion. Author gives a list of 31 drugs which more than 50 per cent of the physicians favored deleting. Another list of 30 received absolute unanimity of opinion for retention. Comments by the author are included as to the necessity for the deletion of such drugs as aconite on account of the dangers attending its use; squill, on account of its indesirable side actions; pepo, claimed to be absolutely worthless; and gelsemium, which is of no great medicinal importance. Author presents a list of 22 drugs which might well be deleted. The suggestion is offered to delete the crude drugs in case of aromatic oil drugs and to retain their respective volatile oils.—*Anton Hogstad, Jr.*

1977. Bourquelot, Em., and M. Bridel. **Recherche et caractérisation du glucose dans les végétaux, par un procédé biochimique nouveau.** [The detection of glucose in plants by a new biochemical process.] Compt. Rend. Acad. Sci. Paris 170: 631–635. 1920.—See Bot. Absts. 6, Entry 2002.

1978. Grant, E. H. **New tests for some purgative drugs.** Jour. Amer. Pharm. Assoc. 9: 763–766. 1920.—A series of new color tests for a number of purgative drugs, namely, Scammony, Jalap, Leptandra, Gamboge, Podophyllum, Senna, Rhubarb, Butternut (bark of root), Cassia Fistula, and Chionanthus. The tests given for Gamboge, Podophyllum, Senna, Rhubarb and Chionanthus were found to be quite characteristic; the other tests while being far from conclusive, are of value in assisting to identify these drugs.—*Anton Hogstad, Jr.*

1979. Hoffstein, B. H. **Notes on henna.** Amer. Jour. Pharm. 92: 543–547. 1920.—A brief review of the historical usages of henna. Analysis of one of the so-called henna hair dyes disclosed the following combination: powdered sumac, henna, ferrous sulphate, and copper sulphate. Another sample was found to contain pyrogallol and henna in one container, and a mixture of ammonium chloride and copper sulphate in the other. Attention is called to the erroneous statement that henna does not contain tannin, which has been copied and recopied from time to time. Method for the extraction of the tannin is given as follows: Extract chlorophyll with ether; then percolate with 90 per cent alcohol; distil off the alcohol and again exhaust the syrupy residue with ether; dissolve residue in 95 per cent alcohol and again distil off alcohol. This method yields a resinoid tannin, which is soluble in hot water and capable, like other tannins, of reacting with ferric salts and gelatine.—*Anton Hogstad, Jr.*

1980. Kraemer, Henry. **Michigan—An important source of raw vegetable products.** Michigan Acad. Sci. Ann. Rept. 21: 167–199. 1919.—The author notes the influence of the Great War on the supply of raw vegetable products, especially crude drugs in America, and points out the desirability of cultivating many of the common medicinal plants in the United States. A short account is given of efforts that have already been made along this line and the obstacles to be overcome. One noteworthy success is mint oil culture in Michigan. Michigan contains many wild medicinal plants and has a climate favorable to the cultivation of many European drug plants. At the present time it has a greater acreage devoted to the cultivation of medicinal plants than any other state. The author presents a summary of recent experiments in the growing of medicinal plants at the University of Michigan botanical gardens. About fifty different species were grown, with a total of 20,000 individual plants, of which 15,000 were harvested, giving abundant material for tests.—*H. T. Darlington.*

1981. Leape, H. M., and H. E. Annett. **Investigations concerning the production of Indian opium for medicinal purposes.** Agric. Jour. India 15: 124–134. 1920.—See Bot. Absts. 6, Entry 1422.

1982. Marsh, C. Dwight, and A. B. Clawson. **Astragalus tetrapterus, a new poisonous plant of Utah and Nevada.** U. S. Dept. Agric. Dept. Circ. 81: 3–6. *2 fig.* 1920.

1983. Marsh, C. Dwight. **A new sheep-poisoning plant of the southern states.** U. S. Dept. Agric. Dept. Circ. 82: 1–3. *1 fig.* 1920.—*Daubentonia longifolia.*

1984. Marsh, C. Dwight, and Glenwood, C. Roe. **Sweet-clover-seed screenings not injurious to sheep.** U. S. Dept. Agric. Dept. Circ. 87: 3–7. 1920.

1985. Marsh, C. Dwight. **The whorled milkweed, a plant poisonous to livestock.** U. S. Dept. Agric. Dept. Circ. 101: 1–2. *1 fig.* 1920.—*Asclepias galioides.*

1986. Praeger, W. E. **A collection of Sphagnum from the Douglas Lake region, Cheboygan County, Michigan.** Michigan Acad. Sci. Ann. Rept. 21: 237–238. 1919.—The collection of Sphagna was made in order to determine the value of Sphagnum as a surgical dressing. Twenty-six species were found, one of which was first grade dressing material; one was fair, and two were poor but might be used. Samples may be found in the cryptogamic herbarium of the University of Michigan for reference in any future study of the subject.—*Bertha E. Thompson.*

1987. Rock, J. F. **The poisonous plants of Hawaii.** Hawaiian Forester and Agric. 17: 59–62. 1920.—Twelve species are given as being internal poisons, of which four are native to the Territory, the remainder being introduced forms. Recognition characters are given in each case. The native plants included are Akia (*Wikstroemia* spp.), Auhuhu or Hola (*Tephrosia piscatoria*), Kikania (*Solanum* spp.), and Kukui, (*Aleurites moluccana*). The first two of these are employed by the natives to stupefy fish. Both also are poisonous to stock. The introduced plants include common Night Shade, Jimson Weed, Castor Oil Bean, Poinsettia, and Oleander.—*Stanley Coulter.*

1988. Rock, J. F. **The poisonous plants of Hawaii.** Hawaiian Forester and Agric. 17: 97–100. 1920.—This concluding portion of Dr. Rock's article includes thirteen additional plants as poisonous. Most of them are introduced, and most of them are easily recognized.—*Stanley Coulter.*

1989. Russell, G. A. **A machine for trimming camphor trees.** U. S. Dept. Agric. Dept. Circ. 78: 3–8. *4 fig.* 1920.—Discussion of mechanism for harvesting camphor material, and description of the machine for trimming camphor trees.—*L. R. Hesler.*

1990. Scott, W. R. M., and E. J. Petry. **Correlation of variation in resin content of Podophylum with certain habitats.** Michigan Acad. Sci. Ann. Rept. 21: 225–231. 1919.

1991. Tommasi, G. **Ricerche sull'Henna (Lawsonia inermis L.) Sulla costituzione chimica del Lawsone.** [**Researches upon Lawsonia inermis L. and upon the constitution of Lawsone.**] Gazz. Chim. Ital. 50: 263–272. 1920 (Part I).—The powdered leaves of *Lawsonia inermis* L. from Tripoli, Africa, were extracted with cold water, and the extract was treated with lime water, strongly acidified with HCl, and extracted with ether. Treatment with lime water and strong shaking over ether allow the water layer to assume a strong red-orange coloration. Solution of the product and subsequent additional extraction with ether in strongly acid solution further purify the substance. The compound obtained after numerous extractions and purifications is named by the author "Lawsone." It has a M.P. of 192–195°C., is decomposed at this temperature, and has a M.W. of 174.05, an empirical formula of $C_{10}H_6O_3$, with an elementary composition on analysis of C — 68.95; H — 3.48; O — 27.57 per cent. The structural formula appears to be that of a 2-oxy-1-4-naphthaquinone. It may be used as a dye for wool, silk, and leather.—*A. Bonazzi.*

1992. Viehoever, Arno. **Commercial hydrastis (goldenseal).** Jour. Amer. Pharm. Assoc. 9: 779–784. *1 fig.* 1920.—A report on the analyses of a number of samples of hydrastis collected in various states of the U. S. A., giving moisture content, alkaloidal content, total ash and acid insoluble ash content. From the results obtained the author suggests that the required minimum alkaloidal content of hydrastis be raised to 2.75 per cent of ether-soluble

alkaloids, and that a maximum of 8 per cent be established for total ash and 3 per cent for acid insoluble ash. The rhizome portions were found to have a higher alkaloidal content than the roots, thereby confirming a previous report in literature,—*Anton Hogstad, Jr.*

1993. Youngken, H. W., and C. F. Slotter. **Studies on commercial varieties of nux vomica.** Amer. Jour. Pharm. **92**: 538–540. 1920.—A discussion as to some means of distinguishing between a number of varieties of nux vomica; namely, Tellicherry, Madras, Cochin and Ceylon. The descriptions include the outer morphological characteristics, specific gravity, and measurements of the hairs and the outer endosperm cells.—*Anton Hogstad, Jr.*

## PHYSIOLOGY

B. M. Duggar, *Editor*
Carroll W. Dodge, *Assistant Editor*

### DIFFUSION, PERMEABILITY

1994. Girard, Pierre. **Relation entre l'état électrique de la paroi de la cellule et sa perméabilité à un ion donné. [Relation between the electrical state of the cell membrane and its permeability to a given ion.]** Compt. Rend. Acad. Sci. Paris **169**: 94–97. 1919.

1995. Shull, C. A. **Absorption of gold.** [Rev. of: Williams, Maud. **Absorption of gold from colloidal solution by fungi.** Ann. Bot. **32**: 531–534. 1918. (See Bot. Absts. 2, Entry 194.)] Bot. Gaz. **68**: 392. 1919.

### MINERAL NUTRIENTS

1996. André, G. **Répartition des éléments minéraux et de l'azote chez le végétal étiolé. [The distribution of the mineral elements and the nitrogen in etiolated plants.]** Compt. Rend. Acad. Sci. Paris **167**: 1004–1006. 1918.—Kidney beans were grown for twenty-five days. Analysis showed about two-thirds of the lime and one-third of the sulphur present in the cotyledons. Nearly three-fourths of the nitrogen and phosphorus were present in the roots and stems, while the magnesium and potassium were approximately in equal proportions in cotyledons and roots and stems.—*G. M. Armstrong.*

1997. Coupin, Henri. **Sur l'absorption des sels minéraux par le sommet de la racine. [On the absorption of mineral salts by the root tip.]** Compt. Rend. Acad. Sci. Paris **169**: 242–245. 1919.—The plants employed were peas, castor-oil plant, and lupine. Tips of seedlings were dipped in Knop's solution and in distilled water. Differences in growth indicated that nutritive salts were absorbed through the root tip in the first case.—*V. H. Young.*

1998. Gautier, Armand, and P. Clausmann. **Action des fluores sur la végétation: B. Cultures en champ d'expériences. [Action of fluorides on vegetation: experimental cultures.]** Compt. Rend. Acad. Sci. Paris **169**: 115–122. 1919.—Preliminary experiments with artificial media containing compounds of fluorine were not entirely conclusive, but later experiments with the somewhat soluble calcium fluoride, added to ordinary soil, gave interesting results. In its natural state this soil contained 88 mgm. of fluorine per kgm. Calcium fluoride was added at the rate about 56 grams per square meter on small plots, and adjacent plants received chalk containing an equal amount of calcium. The following crop plants were used: wheat, oats, barley, carrots, turnips, potatoes, beets, kidney-beans, peas, cabbage, poppies, etc. In most cases a marked increase was to be noted, although in a few cases the results gave an indifferent or even a lower yield. The authors believe that fluorine accompanies phosphorus in plant tissues and seems to assist in its fixation in plant tissues. Since phosphorus is so important in stimulating the growth of plants, it is believed that the use of fluorides on soils promises to be of great benefit. Fluorine from vegetable tissues does not appear to be assimilated by animals, but is excreted directly.—*V. H. Young.*

## PHOTOSYNTHESIS

1999. Ravenna, C. **Sulla formazione dell'amido nelle piante verdi.** [Starch formation in green plants.] Gazz. Chim. Ital. 50: 359–361. 1920.—This is an answer to some criticisms and misunderstanding regarding previous work of the author on the subject. Pollacci (Atti dell'Istit. Bot. Univ. Pavia Ser. 2. Vol. 17: 29. 1917) questions the value of experiments on the basis of lack of experimental controls, and in the present note Ravenna points to the value of and interpretation to be given to the controls which he had established in his work.—*A. Bonazzi.*

2000. Saunders, J. T. **A note on photosynthesis and hydrogen ion concentration.** Proc. Cambridge Phil. Soc. 19: 315–316. 1920. –Slight variations in hydrogen-ion concentration in shallow water is due to photosynthetic activity of plants present.—*Michael Levine.*

2001. Smith, A. Malins. **The temperature coefficient of photosynthesis: a reply to criticism.** Ann. Botany 33: 517–536. *2 fig.* 1919.—The author analyses the criticism in three papers which have appeared recently discussing current conceptions respecting photosynthesis and the relation of environmental factors to this process. All three criticisms appeared in the Philippine Journal of Science, two being by Brown and Heise, and one by Brown, —*B. M. Duggar.*

## METABOLISM (GENERAL)

2002. Bourquelot, Em., and M. Bridel. **Recherche et caractérisation du glucose dans les végétaux, par un procédé biochimique nouveau.** [The detection of glucose in plants by a new biochemical process.] Compt. Rend. Acad. Sci. Paris 170: 631–635. 1920.—A new method is described which constitutes an absolutely diagnostic test for glucose and allows quantitative determinations to be made. The solution or extract of tissue to be tested is mixed with methyl alcohol and emulsin. A methyl glucoside is formed which may be crystallized out by evaporating the solution to dryness *in vacuo* and boiling the residue with acetic ether; the glucoside crystallizes upon cooling. It is laevorotary. A study is made of known mixtures of sugars to make sure that glucose is the only one involved in this reaction. Some plant tissues are also studied.—*C. H. and W. K. Farr.*

2003. Posternak, S. **Sur la synthèse de l'ether hexaphosphorique de l'inosite et son identité avec la principe phospho-organique de réserve des plantes vertes.** [On the synthesis of hexa-phosphoric ether of inosite and its identity with the phospho-organic principles of green plants.] Compt. Rend. Acad. Sci. Paris 169: 138–140. *1 fig.* 1919.—Hexa-phosphoric ether of inosite was prepared synthetically and found to be identical with the phospho-organic reserve of green plants.—*V. H. Young.*

2004. Woo, M. L. **Chemical constituents of Amaranthus retroflexus.** Bot. Gaz. 68: 313–344. *11 fig.* 1919.—There is a large amount of nitrate in the organs of *Amaranthus retroflexus*, especially in the stem and branches. The rate of nitrate absorption increases with age. This high capacity for nitrate absorption and storage must be an important factor in competition with cultivated plants, since nitrate deficiency so commonly limits crop production. The carbohydrates and nitrogen compounds fluctuate throughout the growing period in inverse ratio to one another. The seeds contain much more organic than inorganic phosphorus. The distribution of nitrogen in the seeds is in the same order as that of the phosphorus. The predominating sugars in the seeds are the polysaccharides. The presence of nitrogen and phosphorus in the lipin fraction indicates that the seeds contain phosphatides.—*H. C. Cowles.*

## METABOLISM (ENZYMES, FERMENTATION)

2005. Willaman, J. J. **Tyrosinase of fungi.** [Rev. of: Dodge, C. W. **Tyrosin in the fungi: chemistry and methods of studying the tyrosinase reaction.** Ann. Missouri Bot. Gard. 6: 71–92. 1919. (See Bot. Absts. 4, Entry 1446.)] Bot. Gaz. 68: 392. 1919.

## GROWTH, DEVELOPMENT, AND REPRODUCTION

2006. Besredka, A. **L'oeuvre de Metchnikoff sur la sénescence.** [The work of Metchnikoff on senility.] Bull. Inst. Pasteur 17: 209–223. 1919.—This is an extract from the book by Besredka which is published under the title: **Histoire d'une idée.** It covers the whole activity of Metchnikoff in the broader zoological phase of the subject and therefore contains material of interest to the physiologist. The great importance to be ascribed to phagocytosis in pathological conditions and in senility is here emphasized, but the secondary nature of this phenomenon is insisted upon. The rôle of intoxicating agents is treated, and the function of the intestinal flora in intoxication is discussed in the light of the work issuing from the laboratory of Metchnikoff on the subject of aseptic life.—*A. Bonazzi.*

2007. Bessey, E. A. **The effect of parasitism upon the parasite—a study in phylogeny.** Michigan Acad. Sci. Ann. Rept. 21: 317–320. 1919.—See Bot. Absts. 6, Entry 1934.

2008. Friesner, Ray C. **Periodicity of elongation and cell division.** (Preliminary note.) Michigan Acad. Sci. Ann. Rept. 21: 233–234. 1919.—Roots of *Curcurbita Pepo, Lupinus albus, Pisum sativum, Zea everta, Vicia faba,* and *Allium cepa* were used. Elongation occurs usually in waves three hours apart. There are also secondary waves from two to four in number every 24 hours. Maximum elongation alternates with maximum cell division.—*Richard de Zeeuw.*

2009. Harlan, Harry V., and Stephen Anthony. **Development of barley kernels in normal and clipped spikes and the limitations of awnless and hooded varieties.** Jour. Agric. Res. 19: 431–472. *13 fig.* 1920.

## GERMINATION, RENEWAL OF ACTIVITY

2010. Green, Frederick J. **Germinative capacity of pine seed.** Quart. Jour. Forest. 14: 140–141. 1920.—See Bot. Absts. 6, Entry 554.

## RADIANT ENERGY RELATIONS

2011. Coupin, Henry. **Sur le temps que la chlorophylle met à se developper à son maximum d'intensité à la lumière.** [On the time required for chlorophyll to develop to its maximum intensity in light.] Compt. Rend. Acad. Sci. Paris 170: 753–754. 1920.—This is a continuation of the previous studies appearing on page 403 of this volume. A determination is made of the exposure to diffuse light required in order that etiolated seedlings may become as green as those grown in light. It is found, for example, that the leaves of sugar corn require only one day, whereas the hypocotyl of chicory requires fifteen days.—*C. H. and W. K. Farr.*

2012. Harvey, E. Newton. **The nature of animal light.** *182 p., 35 fig.* J. B. Lippincott Co.: Philadelphia, 1920.—While this book deals with luminescence in animal forms, it is of general interest to physiologists and at the same time includes also a list of luminous organisms including both animal and plant forms.—*B. M. Duggar.*

## TOXIC AGENTS

2013. Coons, G. H., and Genevieve Gillette. **Phenol injury to apples.** Michigan Acad. Sci. Ann. Rept. 21: 325–329. *Pl. 14.* 1919.—See Bot. Absts. 6, Entry 1938.

2014. Coons, G. H., and H. H. McKinney. **Formaldehyde injury to wheat.** Michigan Acad. Sci. Ann. Rept. 21: 321–324. 1919.—See Bot. Absts. 6, Entry 1939.

2015. Crocker, William. **Zinc and growth of Aspergillus niger.** [Rev. of: Steinberg, R. A. **A study of some factors influencing the stimulative action of zinc sulphate on the growth of Aspergillus niger. I. The effect of the presence of zinc in the cultural flasks.** Mem. Torrey Bot. Club 17: 287–293. 1918. (See Bot. Absts. 1, Entry 744.)] Bot. Gaz. 68: 391–392. 1919.

2016. Rigg, George B., and T. G. Thompson. **Colloidal properties of bog water.** Bot. Gaz. 68: 367–379. 1919.—Bog water gives a precipitate on standing a few hours after saturation with electrolytes, or upon standing a year or more without electrolytes. The filtrate from the precipitation with $(NH_4)_2SO_4$, when dialyzed until free from sulphates, is not toxic to the root hairs of *Tradescantia* cuttings; bog water, when dialyzed for the same length of time as this filtrate, is toxic to these root hairs. The distillate from bog water gives no precipitate with electrolytes, is much less acid than bog water, and is not toxic to these root hairs. The concentrate obtained when bog water is distilled to approximately one-sixth of its original volume gives a heavier precipitate with electrolytes than does bog water; it is also more acid and toxic to these root hairs. The residue from complete evaporation of bog water is a brownish powder which is soluble in cold water; insoluble in alcohol and gasoline, and practically insoluble in ether; this water solution of the residue is toxic to the root hairs of *Tradescantia*. No solid matter was thrown out of bog water by centrifuging. Chemical analyses of Puget Sound bog waters give results similar to those reported for other American bog waters. The toxicity of bog waters to *Tradescantia* cuttings seems to be connected with the matter in it that is in a colloidal state. The oxidation of this toxic matter to non-toxic matter seems to be a basis of agricultural practice in bringing bog lands into cultivation.—*George B. Rigg and T. G. Thompson.*

2017. Schreiner, Oswald, B. E. Brown, J. J. Skinner, and M. Shapovalov. **Crop injury by borax in fertilizers.** U. S. Dept. Agric. Dept. Circ. 84. *35 p. Fig. 1–25.* 1920.—See Bot. Absts. 6, Entry 1431.

## MISCELLANEOUS

2018. Roberts, Herbert F. **An improved colorimeter for color inheritance study.** Plant World 22: 262–269. *4 fig.* 1919.—Improvements of the tintometer are described and illustrated. The instrument is said to be especially valuable in quantitative measurement of color value in flowers, in a study of color inheritance, as in determining the color value of segregates, and in quantitative color determinations generally.—*C. A. Shull.*

# SOIL SCIENCE

J. J. Skinner, *Editor*
F. M. Schertz, *Assistant Editor*

## GENERAL

2019. Free, E. E. **The utility of soil surveys.** [Rev. of: Pendleton, Robert Larimore. **Are soils mapped under a given type name by the Bureau of Soils method closely similar to one another?** Uni. California Publ. Agric. Sci. 3: 369–498. 1919.] Plant World 22: 272–274. 1919.

2020. Gardner, Frank D., asst. by R. M. Blasingame. **Soils and soil management.** *6 × 9 inches, 223 p., 97 fig.* John C. Winston Company: Chicago and Philadelphia, 1920. A non-technical manual on the management of soil for the production and maintenance of fertility, with a section on farm building and equipment.—*J. J. Skinner.*

2021. Grumert, Artur. **Anleitung zur Dranage.** [Guide to drainage.] Landw. Hefte 39 and 40: 5–66. *1 pl., 38 fig.* 1919.—A comprehensive treatise on the theory and practice of agricultural drainage.—*C. V. Piper.*

2022. Kühr, C. A. H. von Wolzogen. **Het zure bibitrot bij het suikerriet.** [Sour cutting-rot of sugar cane.] Arch. Suikerindust. in Nederlandsch-Indië 28: 703–756. *24 fig.* 1920.—See Bot. Absts. 6, Entry 1948.

2023. Stead, Arthur. **The agriculture and soils of the Cape Province.** Jour. Dept. Agric. Union of South Africa. 1: 351–358. 1920.

2024. Weir, W. W. **Productive soils.** *6 × 9 inches, 398 p., 235 fig.* J. B. Lippincott Co.: Philadelphia and London, 1920.

## METHODS

2025. Hibbard, R. P., and S. Gershberg. **The biological method of determining the fertilizer requirement of a particular soil or crop.** Michigan Acad. Sci. Ann. Rept. 21: 223–224. 1919.—See Bot. Absts. 6, Entry 1419.

2026. Lipscomb, G. F., C. F. Inman, and J. S. Watkins. **The determination of borax in fertilizer materials and mixed fertilizers.** Amer. Fertilizer 52: 57–8. 1920.—The method described is similar in its general procedure to that outlined in following Entry 2027, but differs in the means adopted for removing ammonia, phosphates, etc. An aliquot corresponding to 1 g. of the sample is made alkaline with sodium hydroxide and boiled down nearly to dryness, and then diluted with water and the same operation repeated twice. The residue is taken up in dilute hydrochloric acid, the solution made alkaline with lime water, and filtered without boiling. The filtrate is evaporated to dryness and ignited to destroy organic matter, the residue taken up in a little dilute hydrochloric acid, made alkaline with sodium hydroxide, and the addition of lime repeated to insure complete removal of phosphates. The borax remains in the filtrate and may then be determined by titration.—*W. H. Ross.*

2027. Pope, W. B., and William H. Ross. **Qualitative method for the detection of borax in mixed fertilizers.** Amer. Fertilizer 52: 65–66. 1920.—Directions are given for a simple qualitative test for differentiating between fertilizers containing less than 0.1 per cent of borax, the limit set by the Dept. of Agriculture for the maximum allowable in a fertilizer without labeling, and those which contain in excess of this amount. The test is made on a 2 g. sample. This is digested with 50 cc. of 90 per cent alcohol; an aliquot of the clear solution is made alkaline with sodium hydroxide and evaporated to dryness. The residue is ignited to destroy organic matter and then taken up in dilute hydrochloric acid; 1 cc. of tincture of curcumin added, and the mixture is again evaporated to dryness, in a porcelain dish. If borax is present a pink coloration, varying in intensity with the amount, will be deposited on the bottom and sides of the dish. By comparing the color given by an unknown sample with a set of samples containing known amounts of borax, it is possible to apply the method quantitatively in the analysis of samples containing in the neighborhood of 0.1 per cent of borax or less. Nitrates interfere with the test and must be destroyed when present. This may be done by adding sufficient sucrose to insure complete decomposition of the nitrates when the evaporated residue is ignited.—*W. H. Ross.*

2028. Ross, William H., and R. B. Deemer. **Methods for the determination of borax in fertilizers and fertilizer materials.** Amer. Fertilizer 52: 62–65. 1920.—The procedure recommended for the determination of borax varies with the nature of the material to be analyzed. In the case of mineral salts free from phosphates, or iron and aluminum salts, ammonia, and organic matter, it is possible to determine borax by driving off carbon dioxide from the solution of the salt, making neutral to methyl red and then titrating after adding phenolphthalein as indicator and 1–2 g. of mannitol, with standard sodium hydroxide solution to a permanent pink color. Phosphates, or iron and aluminum salts and ammonia interfere with the determination and the method must therefore be modified to bring about their removal when present. This may be done by adding to the hot solution of the material to be analyzed 15 cc. of a 10 per cent barium chloride solution and sufficient barium hydroxide to give an alkaline reaction. The solution is then boiled for 15 minutes, or until any ammonia present is expelled, filtered and the borax then determined in the filtrate by titration with standard alkali. Soluble organic matter when present interferes in the determination of small amounts of borax (less than 0.5 per cent) and may be removed by evaporating the filtrate from the barium chloride-barium hydroxide precipitate and igniting. The residue is taken up in dilute hydrochloric acid and the addition of barium chloride and barium hydroxide repeated to insure complete removal of phosphates, etc. In the analysis of fertilizers containing in excess of 0.5 per cent of borax, the removal of organic matter may be unnecessary, and the same procedure may then be followed as for the determination of borax in mineral salts.—*W. H. Ross.*

## MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

Burton E. Livingston, *Editor*

2029. Anonymous. List of staffs in botanical departments at home, and in India and the colonies. Kew Bull. Misc. Inf. [London] Appendix 1919: 25–39. 1919.

2030. Gilmore, Melvin Randolph. Uses of plants by the Indians of the Missouri River region. Ann. Rept. Bur. Amer. Ethnology [Washington, D. C.] 33: 45–154. 1919.

2031. Hart, W. E. The botanic garden of Pamplemousses. Kew Bull. Misc. Inf. [London] 1919: 279–286. *Pl. 9–10.* 1919.

2032. Saunders, C. F. Useful wild plants of the United States and Canada. *vi + 275 p.* R. M. McBride & Co.: New York, 1920.

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